

# Journal of the Royal Society of Arts

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VOL. CVI

## FORTHCOMING MEETINGS

WEDNESDAY, 1ST JANUARY, at 2.30 p.m. DR. MANN JUVENILE LECTURE. '*Into Space*', by Patrick Moore, F.R.A.S. (The lecture will be illustrated with lantern slides, and tea will be served in the Library afterwards. For details of admission see Notice on page 70.)

WEDNESDAY, 1ST JANUARY, at 6.30 p.m. FILM EVENING. (See Programme on page 70.)

MONDAY, 6TH JANUARY, at 2.30 p.m. JUVENILE LECTURE. '*Cloth from the Chemist*', by J. R. Whinfield, C.B.E., M.A., F.R.I.C., F.T.I. (Hon.), of Imperial Chemical Industries, Ltd. (The lecture will be illustrated with demonstrations and lantern slides, and tea will be served in the Library afterwards. For details of admission see Notice on page 70.)

THURSDAY, 9TH JANUARY, at 5.15 p.m. COMMONWEALTH SECTION. '*New Zealand Seen by a Political Scientist*', by Professor K. J. Scott, M.A., LL.B., D.P.A., Associate Professor of Political Science, Victoria University College, Wellington, New Zealand. His Excellency the Honble. Sir Clifton Webb, K.C.M.G., Q.C., High Commissioner for New Zealand, in the Chair. (Tea will be served in the Library from 4.30 p.m.)

WEDNESDAY, 15TH JANUARY, at 2.30 p.m. '*Modern Research into Bees and Bee-keeping*', by Stanley Gooding, M.Sc., M.D., J.P., President, British Beekeepers' Association. L. E. Snelgrove, M.A., M.Sc., in the Chair.

WEDNESDAY, 22ND JANUARY, at 2.30 p.m. ALFRED BOSSOM LECTURE. '*The Architecture of New Towns*', by Frederick Gibberd, C.B.E., F.R.I.B.A., M.T.P.I. Sir Alfred Bossom, Bt., LL.D., F.R.I.B.A., J.P., M.P., Chairman of Council of the Society, in the Chair.

THURSDAY, 23RD JANUARY, at 5.15 p.m. COMMONWEALTH SECTION. '*Ghana*', by His Excellency Mr. Edward O. Asafu-Adjaye, High Commissioner for Ghana in the United Kingdom. Sir Selwyn Selwyn-Clarke, K.B.E., C.M.G., M.C., Chairman, Commonwealth Section Committee, in the Chair. (Tea will be served in the Library from 4.30 p.m.)

WEDNESDAY, 29TH JANUARY, at 2.30 p.m. '*The Marriage of Art and Science*', by A. R. J. P. Ubbelohde, M.A., D.Sc., F.R.S., Professor of Thermodynamics, University of London (Imperial College of Science and Technology). Robin Darwin, C.B.E., A.R.C.A., Principal, Royal College of Art, in the Chair.

WEDNESDAY, 5TH FEBRUARY, at 2.30 p.m. '*Setting the Stage*', by Laurence Irving, O.B.E., R.D.I.

TUESDAY, 11TH FEBRUARY, at 7.30 p.m. FILM EVENING. (Programme will be announced in the next issue of the *Journal*.)

WEDNESDAY, 12TH FEBRUARY, at 2.30 p.m. '*The Inhabitants of Switzerland*', by Sir Gavin de Beer, F.R.S., Director, The British Museum (Natural History). His Excellency Mons. Armin Daeniker, Swiss Ambassador, in the Chair.

THURSDAY, 13TH FEBRUARY, at 5.15 p.m. COMMONWEALTH SECTION. THOMAS HOLLAND MEMORIAL LECTURE. '*The University of Malaya*', by Sir Sydney Caine, K.C.M.G., Director, London School of Economics and Political Science. His Excellency Dato Nik Kamil, C.B.E., High Commissioner for Malaya, in the Chair. (Tea will be served in the Library from 4.30 p.m.)

*Fellows are entitled to attend any of the Society's meetings without tickets (except where otherwise stated), and may also bring two guests. When they cannot accompany their guests, Fellows may give them special passes, books of which can be obtained on application to the Secretary.*

### JUVENILE LECTURES

Special tickets for the Juvenile lectures announced above are now available, and will be sent to Fellows on request as far as the accommodation of the Lecture Hall permits.

Fellows are entitled to apply for tickets admitting one adult and two children to each lecture, and should state their exact requirements within these limits when making application.

### FILM EVENING

After Miss Mary Field's lecture on 'Children's Films' in January last, which was illustrated by extracts from a number of films made specially for showing to children, a number of Fellows suggested that it might be of interest to include in one of the regular Film Evenings a complete film of this nature. Miss Field has very readily co-operated in this suggestion and, at the Film Evening to be held on **Wednesday, 1st January, at 6.30 p.m.**, she will be introducing *The Kid from Canada* which, at this year's Venice Film Festival, received a special award for stressing the importance of human relationships between children of different countries. The film will be shown by special permission of the normal exhibitors.

*The Kid from Canada* (60 minutes) was produced for the Children's Film Foundation by Anvil (Scotland) Ltd. It tells of a Canadian boy's holiday in

Scotland which involved him in plenty of adventure amid fine Highland scenery.

The following short documentary films will also be shown:

*Halley Bay* (17 minutes) is a fascinating colour film record, made by members of the advance party of the Royal Society Antarctic Expedition and of the Society's staff, of the work of the party in setting up their base at Halley Bay in connection with the International Geophysical Year.

*Down a Long Way* (15 minutes), made for B.P. by Halas & Batchelor, is an entertaining colour cartoon illustrating the way in which oil men search for oil, how they decide where to drill, and the drilling operation itself.

Tickets of admission are not required, and Fellows are invited to introduce two guests (their older children are specially invited). Light refreshments will be served in the Library, *before the show*, from 5.45 p.m.

### MEETING OF COUNCIL

A meeting of Council was held on Monday, 9th December, 1957. Present: Sir Alfred Bossom (in the Chair); Mrs. Mary Adams; The Honble. G. C. H. Chubb; Sir Edward Crowe; Mr. P. A. Le Neve Foster; Sir Ernest Goodale; Sir William Halcrow; Dr. R. W. Holland; Lord Latham; Mr. Edgar Lawley; Sir Herman Lebus; Mr. F. A. Mercer; Mr. Oswald P. Milne; The Earl of Radnor; Mr. A. R. N. Roberts; Sir Harold Saunders; Sir Selwyn Selwyn-Clarke; Sir Stephen Tallents; Professor S. Tolansky; Mr. Hugh A. Warren; Sir Griffith Williams; Miss Anna Zinkeisen; with Dr. K. W. Luckhurst (Secretary) and Mr. G. E. Mercer (Deputy Secretary).

### ELECTIONS

The following candidates were duly elected Fellows of the Society:

- Appleton, Reginald John, Brighton, Sussex.
- Barber, Alan Albert, Edenbridge, Kent.
- Baxter, Professor John Philip, O.B.E., B.Sc., Ph.D., Enfield, N.S.W., Australia.
- Beetham, Jack Thomas Halsey, B.Sc., Southsea, Hants.
- Coleman, John Leslie, Manchester, Lancs.
- Dollar, Miss Lavender Violet, London.
- Gasser, Henry Martin, Summit, New Jersey, U.S.A.
- Gregory, Robert Malcolm, London.
- Halliday, Arthur, Dundalk, Ireland.
- Harper, Geoffrey Thomas, Hove, Sussex.
- Jackson, Thomas Henry, Marlow, Bucks.
- La Ferla, Joseph M., Sliema, Malta G.C.
- McLeish, Howard, M.B., Ch.B., Richmond, Surrey.
- Newlove, Harold, Hinckley, Leics.
- Pyart, Raymond Sidney, Churchdown, Glos.
- Rickard, John, Poole, Dorset.
- Ridyard, Richard Dalton, Wath-on-Deane, Yorks.
- Thomas, Jack Vincent, A.M.I.Mech.E., Amersham, Bucks.
- Turnham, Donald Stuart, B.Sc., Clacton-on-Sea, Essex.
- Whitmore, Professor Bernard George, B.Sc., M.A., Ph.D., Winnipeg, Manitoba, Canada.

Williamson, Jack Leslie, Somerset, Bermuda.

Woodhouse, Peter, Guisborough, Yorks.

Worsley, Flying Officer Geoffrey Leonard, B.A., A.R.I.B.A., Lytham St. Annes, Lancs.

The following was elected an Associate Member:

Crowther, Miss Julia Angela, London. (*Examinations Silver Medalist.*)

The following were admitted as Institutions in Union:

Dudley and Staffordshire Technical College, Dudley, Worcs.

Newcomen Society in North America, Pennsylvania, U.S.A.

School of Agriculture, Sutton Bonington, Leics.

Technical Education Division, Perth, Western Australia.

#### ROYAL WEDDING ANNIVERSARY

The Chairman read a telegram of congratulation sent to H.M. The Queen and H.R.H. Prince Philip on the occasion of their tenth Wedding Anniversary, and Her Majesty's gracious reply.

#### LIFE MEMBERSHIP

Mr. Oswald P. Milne was elected an Honorary Life Member of the Society, under Bye-law 53, on the completion of 50 years as a Fellow.

#### OTHER BUSINESS

A quantity of financial and other business was transacted.

### OFFER OF ENDOWED PRIZES, 1958

The Society, as Trustee for the undermentioned endowments, offers the following prizes during the year 1958:

#### HOWARD PRIZE OF £50 FOR MECHANICAL MOTIVE POWER

The Howard Trust was established in 1868 for the purpose of making awards periodically to the authors of treatises on steam or other motive agents, and a prize of £50 is offered for award to the author of a treatise on some aspect of the subject of motive agents.

#### FOTHERGILL PRIZE OF £20 FOR FIRE PREVENTION OR FIRE-FIGHTING

Under the Fothergill Trust (established by the will of Dr. Fothergill in 1821) a prize of £20 is offered for a descriptive essay or model embodying some new idea for the prevention or suppression of fire.

#### *Conditions of Entry*

(1) Entries for the above prizes must be received by the Secretary of the Royal Society of Arts, 6/8, John Adam Street, Adelphi, London, W.C.2, not



later than 31st July, 1958, and must be clearly marked with the entrant's name and address, and the prize for which they are submitted. Essays must be type-written.

(2) The Society cannot accommodate bulky apparatus for judging. Entries must be submitted in the form of written descriptions or models, but the Society may subsequently require a demonstration with the actual apparatus.

(3) The Society reserves the right to divide or withhold all or any part of the above prizes, should the quality of the entries, in the opinion of the judges, justify such a course.

(4) The Society reserves the right to exhibit or publish any entries (the copyright being retained by the competitor).

(5) The Society cannot accept any responsibility for the safety of papers or models submitted to it for the purpose of these awards.

(6) The decision of the Council of the Society regarding all matters connected with the awards will be final, and correspondence cannot be entered into regarding the reasons for any decisions it may take.

The Council is anxious to give the widest publicity to these offers and would therefore appreciate any assistance which Fellows may be able to give in making them known. Copies of the particulars for distribution will be sent on request.

The results of the 1957 Competition were announced in the *Journal* for 25th October, 1957.

#### JOURNAL INDEX AND BINDING CASES

The index and title-page for Volume 105 are now ready, and will be sent, free of charge, to Fellows who ask for them. Orders for binding cases (with which copies of the index and title-page are automatically supplied) price 7s. each, post free, should be sent to Messrs. P. G. Chapman & Co., Ltd., Kent House Lane, Beckenham, Kent, who will also undertake binding at an additional cost.

#### JOURNAL OFFPRINTS

In view of the increased price of the *Journal* in its monthly form, it has been decided to produce separate offprints of each of the lectures and papers published therein, as a service to Fellows who wish to acquire additional copies of these at a comparatively small cost. These offprints, on good quality paper, will in each case consist of the pages of a lecture or paper (and any discussion) as printed in the *Journal*, stapled together without a cover. They will cost 1s. 6d. net each.

# WILLIAM BLAKE: THE VISIONARY MAN

*A paper by*

V. DE S. PINTO, M.A., D.Phil., F.R.L.S.,

*Professor of English in the University of Nottingham  
and Chairman of the William Blake Bicentenary  
Celebrations Committee, read to the Society on  
Wednesday, 27th November, 1957, with Sir  
Geoffrey Keynes, M.A., M.D., F.R.C.P., F.R.C.S.,  
in the Chair*

THE CHAIRMAN: William Blake enthusiasts are having a rather busy week, with the unveiling of the monument by Sir Jacob Epstein in Westminster Abbey on Sunday, the lecture here to-day, another one this evening at the National Book League, the opening of the Exhibition at the Tate Gallery to-morrow and, in a few days time, the unveiling of the plaque at St. James's, Piccadilly. I have already been privileged with a preview of the lecture we are now to hear, and I know it is a very good one.

*The following paper was then read:*

## THE PAPER

A contemporary of William Blake called Dr. John Trusler published a book entitled *The Way to be Rich and Respectable*. This title summarizes very well the ideal of most Englishmen of Blake's time. It was the England of George III and George IV, a nation dominated by that 'impregnable philistinism' which Matthew Arnold later on described so eloquently. Its prophets were Bacon, Newton and Locke. It lived in a solid, material universe of Hard Facts, the universe of Mr. Gradgrind. It was the age of purple-faced squires, pluralistic clergymen, Regency bucks, prizefighters, hanging judges, pressgangs and debtors' prisons, the world of which we get a vivid impression from the prints of Gillray and Rowlandson. William Blake was a lonely prophet in that world, a man who was almost in a minority of one. He refused to be rich or respectable, though he could easily have become both if he had wanted to. He refused to believe in the solid, material universe of Hard Facts. He had the temerity to denounce Bacon, Newton and Locke as false prophets. He spoke most disrespectfully of Sir Joshua Reynolds, the great oracle of English official and academic art. He painted pictures which looked like nothing in the visible world as it appeared to the eyes of the commonsense Englishman and he wrote poems which seemed to be entirely incomprehensible to the average intelligence. 'There are States', he wrote, 'in which all Visionary Men are accounted Mad Men; such are Greece and Rome.' Such, he might have added, with even more justice, was Georgian England. A number of Blake's contemporaries thought he was mad. Robert Hunt, a well-known journalist of the time, reviewing Blake's

exhibition of pictures held in 1809, described him as 'an unfortunate lunatic, whose personal inoffensiveness secures him from confinement, of whom no public notice should be taken'. There were indeed a few who recognized his genius. Coleridge, Lamb and Landor praised his poems, and Wordsworth, though he said that Blake was mad, added significantly 'there is something in the madness of this man that interests me more than the sanity of Lord Byron and Sir Walter Scott'. Then there was that admirable man Thomas Butts, the generous and discerning patron, who was wise enough to buy Blake's paintings and drawings throughout his life and to give him many commissions. Moreover some of the most notable artists of the day such as Fuseli, Flaxman and, strangely enough, the fashionable portrait painter Sir Thomas Lawrence, admired his pictures. Then in his old age Blake became the centre of a group of gifted young artists who looked up to him with reverence as their leader and prophet. It was largely through this group, the 'Ancients' as they called themselves, John Linnell, George Richmond, Edward Calvert and Samuel Palmer, that the Blake tradition was handed on to the men who introduced Blake to the general public in the mid-nineteenth century: Alexander Gilchrist who wrote the first biography, D. G. Rossetti who preserved one of Blake's most precious manuscripts, completed the biography which Gilchrist left unfinished at his death, and published it in 1863, and the poet A. C. Swinburne, who in 1868 published the first critical study of Blake, a book that is wrongheaded and confused in many places, but which is, nevertheless, very memorable for its magnificent enthusiasm and its eloquent and generous championship of Blake as a man and a poet.

Through the work of these men Blake's reputation as a poet and an artist was established in Victorian England. He was regarded as a brilliant if wayward and eccentric artist, and a writer of beautiful lyrics about children and longer works, the so-called Prophetic Books, which were looked upon as a hopeless jumble of private associations lit by occasional gleams of high poetry. It has been left to the twentieth century to receive the full revelation of Blake's greatness. André Gide wrote of him 'C'est une étoile très pure et très lointaine dont les rayons commencent seulement à nous atteindre'. Through the labours of a devoted band of scholars of whom the most notable is our chairman, Sir Geoffrey Keynes, we are now able to read everything that survives of Blake's writings in easily accessible and completely reliable texts, and through the work of a series of brilliant critics and interpreters, among whom I would name especially Foster Damon, Joseph Wicksteed, Denis Saurat, Middleton Murry, H. M. Margoliouth and Northrop Frye, we now understand that Blake's longer works (he never, by the way, called them Prophetic Books) are no confused jumble, but, as Professor Northrop Frye has written, 'a rigorously consistent body of ideas . . . most carefully constructed and revised. . . . difficult because it was impossible to make them simpler'. In fact, it is now clear to all competent judges that Blake is not only a great poet and artist but one of the most original, profound and inspired of English thinkers—a major English prophet.

This November we celebrate the two hundredth anniversary of his birth, and, it is fitting that, when we acclaim his work as one of the chief glories of our English artistic and intellectual heritage, we also salute those men, whose labours, if I may borrow André Gide's image, like those of a succession of expert astronomers, have brought within the range of our vision this pure and brilliant star, which was for so long obscured by thick clouds of ignorance and prejudice, but which is likely to shine more and more brightly in the spiritual firmament of the second half of the twentieth century.

It may be asked why it was necessary for so many distinguished scholars to labour at the text of Blake's writings in order to produce a correct and reliable edition, and for others to devote so much industry and energy to interpreting them before a true understanding of their meaning could be reached.

The answer to the first of these questions is simple enough. Blake is unique in being the only major English writer who never published any of his works in the ordinary way. His astonishing first book of poems, *The Poetical Sketches*, said to have been written when he was a mere boy between the ages of 14 and 21 and containing some of the loveliest and most original English poetry of the late eighteenth century, was indeed printed in the ordinary way in 1783, apparently through the efforts of some of his friends, but it was never published. The fact that Blake made no effort to get it published suggests that even then he regarded the ordinary methods of publication as unsatisfactory. By the time that *Poetical Sketches* was printed he had already shown himself to be not only one of the most promising young poets of his time but a very competent engraver and a brilliant draughtsman. A passage in his prose satire *An Island in the Moon*, written in 1787, gives clear evidence that by that time he was already thinking of a plan by which he could exercise his dual gift as poet and designer in the production of books in which every page would be an engraving. Shortly afterwards, in the period of creative activity that followed the death of his brother Robert in 1788, he put into practice this daring and original conception by the means of the invention of what he called his 'illuminated printing'. This was really the discovery of a wonderful new art form in which poetry and design could be united in a single organic whole. He first tried it out in two little tracts called *There is no Natural Religion* and *All Religions are One*, and its first important results were the famous *Songs of Innocence and Experience* of 1789-94. In Blake's illuminated books every page was engraved by him by a special process on a copper or pewter plate in such a way that a plate may consist of a picture alone, a page of text alone, or as most often happens a text marginally decorated or a design combined with a certain number of lines of text. A poem called 'Tiriel' that survives in manuscript together with a set of designs seems to show that he thought at first of producing illustrated books of the ordinary kind, i.e., books with separate text and illustrations, but he abandoned that plan for a combination of text and illustration which has never been so successfully achieved since the great illuminated manuscript books of the Middle Ages. When the leaves of the books were separately printed in monochrome, they were coloured in watercolour by Blake and his wife, bound up in paper covers, and

sold by him for prices ranging from a few shillings to ten guineas. Thus he is perhaps the only English writer on record who was at once his own printer, illustrator, publisher and bookseller. I have mentioned Mrs. Blake in connection with the colouring of the plates, and in commemorating her husband we ought to remember what he owed and what we owe to this admirable woman. She was illiterate when she married in 1782. Blake taught her not only to read and write but to draw and to help him in his work. She seems to have been the perfect wife for a man of genius and to have deserved the lyrical praise of the husband who called her his 'sweet Shadow of Delight' and 'a flame of many colours of precious jewels'.

All Blake's numerous books from *The Songs of Innocence and Experience* of 1789-94 to *Jerusalem* of 1804-20 were engraved and 'published' in this way with the single exception of his fragmentary epic *The French Revolution*, which, like *Poetical Sketches*, was printed in the ordinary way but never published. Editors have, therefore, had the difficult task of collecting the texts of his works partly from these numerous rare illuminated books and partly from manuscripts, some of which have only quite recently come to light. The formidable editorial problems involved have, however, been triumphantly solved by Sir Geoffrey Keynes in his great Nonesuch edition, which may fairly be described as one of the most satisfying editions of the works of any great English writer. We must remember, however, that when we read Blake's poems in the cold print of modern editions we are only getting part of the effect of a work of an art which combined poetry, design and colour. The full effect can be obtained only from a study of the rare originals or from coloured reproductions of the separate illuminated books, by far the best of which are the magnificent ones of *The Songs of Innocence and Experience* and *Jerusalem* published by the William Blake Trust.

The reason why Blake's works have stood in need of such an arduous work of interpretation is not so easily explained. An explanation involves a discussion of Blake's visions. In the passage which I quoted at the beginning of this lecture you will remember Blake said that in certain states 'all Visionary Men are accounted Mad Men'. He would certainly have included himself among the Visionary Men. In a sense the term 'visionary' may be applied to all great artists. The distinguishing mark of their work is always that it expresses a fresh and original vision which is not granted to the ordinary man. But Blake was a visionary in a much more special sense of the word than this. Like his younger contemporary William Wordsworth he had visionary experiences in early childhood, but whereas the young Wordsworth saw natural objects 'apparelled in celestial light', the young Blake saw what we might call symbolical figures. At the age of 4, we are told, he saw 'God put his head to the window and that set him a-screaming'. Later his mother beat him for telling her he saw the prophet Ezekiel under a tree, at about the age of 8 he saw 'a tree filled with angels, bright angelic wings bespangling every bough like stars', and during his apprenticeship as an engraver when he was sent to draw the tombs in Westminster Abbey he had visions of 'Christ and the Apostles' on one occasion and on another of 'a great procession of monks and priests'. Now it is not unusual for imaginative



children to have such visionary experiences. It is said that school life knocks all the nonsense out of a boy. Blake never had any regular schooling, so fortunately none of the 'nonsense' was knocked out of him. He expressed his thankfulness in the following lines:

Thank God, I never was sent to school  
To be Flog'd into following the Style of a Fool.

If he had lived a hundred years later he would certainly have been forced to go to school and his visions would doubtless soon have faded 'into the light of common day'. Actually he gave himself a splendid education with the help of books and pictures, and the only regular teaching which he seems to have had was in the crafts of drawing and engraving. So he retained his visionary gift throughout his life and indeed seems to have developed it to a remarkable degree. About 1788 when his brother Robert died he saw his spirit ascend through the ceiling 'clapping its hands for joy', and there are many records of his later visions, notably that of the great figure of The Ancient of Days which he drew as the frontispiece to the book called *Europe* and which he told his friend J. T. Smith 'hovered over his head at the top of the staircase'. It is to be noticed that all these visions of Blake were of human figures or occasionally of animals. He called them 'spirits'. The stories which circulated about them doubtless gave rise to the report that he was mad. There is, of course, no doubt about Blake's sanity. His works and all the records of his life show that he was not merely sane but a man of peculiarly powerful intelligence, great prudence and shrewd judgement. The hallucinations of madmen are quite different from Blake's visions. They are incoherent and meaningless and the madman cannot distinguish them from physical facts. Blake's visions were singularly coherent ('minutely organized', he called them) and always full of significance. Moreover he always made a very clear distinction between his visions and the physical world. When a lady asked him where he saw his visions he tapped his forehead and said 'here'. This is what he meant by 'seeing' his visions. He saw them with what is called the 'inner eye', not with the physical, or as he called it, the 'corporeal' eye. He always insisted that they were the products of his imagination and that everyone else had the same power if they cared to cultivate it. This, however, did not mean that he cast any doubt on their reality. He would have entirely agreed with Shaw's *St. Joan*, who, when told that the visions which she claimed to be revelations from God, came from her imagination, answered 'Of course, that is how the messages of God came to us'. Blake indeed went further and claimed the imagination was the only reality, 'the Eternal Body of Man, God himself, the divine body'. He was very conscious of the fact that his visions and beliefs set him apart from his fellow men. In a rather pathetic couplet he exclaims:

O why was I born with a different face?  
Why was I not born like the rest of my race?

He protected himself against fools and busybodies by his sense of humour and fantasy. Gilchrist tells us that he would 'often in society say things on purpose



to startle and make people stare'. The story that he told a lady about a fairy's funeral which he saw in his garden one evening and the well known record of the imaginary heads of visionary sitters which he drew for John Varley probably represent semi-humorous performances of this kind.

There was a joke once in *The New Yorker* about an artist who said 'I paint what I *don't* see'. This might well have been said by Blake if 'seeing' is taken in the ordinary sense of physical sight. He drew and painted almost exclusively what he 'saw' with the inner eye of imagination. There are two kinds of painters. One is inspired by a vision of the external world. Its spirit is embodied in the remark of Cézanne, 'Je deviens lucide devant la Nature'. The other is only happy when it is dealing with the visions of the inner life and its motto might be the exclamation of Blake's friend Henry Fuseli: 'Damn Nature! She always put me out'. Blake belonged decidedly to the second class, and it must be admitted that he was very unjust to artists of the other kind like Rembrandt, Rubens and Titian.

Blake made some very interesting statements about his visionary powers. At the end of his prose description of 'The Vision of the Last Judgment' he wrote,

I assert for My Self that I do not behold the outward Creation & that to me it is hindrance and not Action; it is as the dirt beneath my feet, No Part of Me. 'What', it will be Question'd 'When the Sun rises, do you not see a round disk of fire somewhat like a Guinea?' 'Oh no, no, I see an Innumerable company of the Heavenly host crying, "Holy, Holy, Holy is the Lord God Almighty"'. I question not my Corporeal or Vegetative Eye any more than I would Question a Window concerning a Sight. I look thro' it & not with it.

Equally important is the description of the different kinds of vision in a poem that he sent in a letter to Thomas Butts on 22nd November, 1802. After telling how he had a 'double vision' of a thistle as 'an old Man gray' as well as visions of his father, brothers and various mythological figures, he goes on to his famous account of the 'fourfold vision'.

Now I a fourfold vision see  
And a fourfold vision is given to me;  
'Tis fourfold in my supreme delight  
And threefold in soft Beulah's night,  
And twofold Always. May God us keep  
From Single vision & Newton's sleep!

The 'Single vision and Newton's sleep' is undoubtedly the vision of the average Englishman of the day who saw the world only as dead matter obeying the mechanical laws of Newtonian physics. The twofold vision would seem to be the simply myth-making power of visualizing the thistle, for example, as 'an old Man gray'. The threefold vision 'in soft Beulah's night' is the sensuous vision of the romantic artist; 'Beulah' is always Blake's symbol for innocent sexuality. The fourfold vision is that of the prophetic poet; it includes all the other kinds and adds to them the power of seeing, as Wordsworth said, 'into the life of things'. Blake himself gave the classic description of it in the quatrain that stands at the head of his poem called *Auguries of Innocence*:

To see a World in a Grain of Sand  
 And Heaven in a Wild Flower,  
 Hold Infinity in the palm of your hand  
 And Eternity in an hour.

This fourfold or prophetic vision was called by Blake the Divine Vision. For him it was the Imagination or creative power in man operating at its highest pitch of intensity. When a human being was in this state Blake believed that he was actually identified with God, the Divine Humanity, becoming a part of Jesus, the complete Man, as he says in *Jerusalem*,

Imagination

Which is the Divine Body of the Lord Jesus blessed for ever.

This may seem a daring heresy, but it is not really very different from the language of the great Christian mystics from St. John and St. Paul onwards. There is indeed the important difference that Blake was an artist, and they belonged to a religious tradition which, as Margoliouth says, 'to keep its spirituality, classed the making of graven images with murder, theft and adultery'. Blake, on the other hand proclaimed that 'Christianity is Art' and boldly equated the Imagination or creative power of the artist with Divine Grace. All this may seem to be taking us a long way from the question why Blake's works have needed such an arduous work of interpretation, but it is all really very relevant to this question. The usual view of the visionary is that he is a sort of in-offensive, moonstruck creature who seeks an escape from reality among daydreams. This was probably the view of Blake held by William Hayley, the well meaning, pompous dilettante who tried to patronize him and turn him into a kind of tame artist on his estate in Sussex. In some very bad verses he calls Blake 'my gentle visionary'. No description could have been more inappropriate. Blake was no 'gentle visionary', but a dynamic, disturbing and truly philosophic visionary. His visions are no escape from reality but an exploration of the spirit, a way of thinking, hard thinking about the most difficult and complex subjects, the meaning of life, the nature of the human mind and the destiny of mankind. This thinking was done by Blake, however, not in the abstract way which has been the chief way of European thought since Aristotle, but in the visionary or pictorial way which was the way of the ancient Hebrew prophets, Isaiah, Ezekiel and the author of the Book of Job, of some of the early Greek thinkers and indeed of Plato himself when he passes in his dialogues from abstract argument to 'myths' or visionary fictions like the story of Er in *The Republic* and that of Atlantis in the *Critias*. This kind of pictorial thinking must not be confused with allegory. Blake himself drew a sharp distinction between the two. 'Fable or Allegory' he wrote, 'are a totally distinct & inferior kind of Poetry. Vision or Imagination is a Representation of what Eternally Exists, Really & Unchangeably.' As Margoliouth has written, 'Blake's work is not allegory but imaginative fiction. "Meaning" or application comes later, for the creative imagination knows more than the surface mind.' The reason then for the difficulty of interpreting Blake's works is threefold: first, we are not used to this

kind of visionary or pictorial thinking; secondly, Blake in his longer works and indeed in many of his lyrics is dealing with extremely difficult and complex subjects; and thirdly, in order to deal with these subjects in his visionary way he has to create an elaborate mythology. It used to be thought that the strange names in these poems such as Urizen, Tharmas, Los, Urthona and the rest were arbitrary fancies. Now through the patient labours of a succession of scholars it is understood that they all have very precise and specific meanings and are essential parts of a great complex of subtle and profound thought.

Because Blake insisted so strongly on the importance of the imagination, it is commonly believed that he despised or neglected the intellect. This view is entirely false. He called The Holy Ghost 'an intellectual fountain' and declared that 'The Treasures of Heaven are not negations of Passion but Realities of Intellect' and that 'The Fool shall not enter Heaven let him be ever so Holy'. What Blake was never tired of denouncing was not the intellect but the undue exaltation of the abstract reasoning power divorced from imagination, 'an Abstract objecting power that negatives everything' as he calls it, which he regarded as the great disease of the modern world. An equally grave mistake is the old view, still quite commonly held, that Blake was a poet who wrote some lovely lyrics in his youth and then lost himself in a jumble of wild, incoherent fantasies. Actually his work as a poet and a designer shows a continuous line of development from the radiant promise of *Poetical Sketches* and such early designs as the lovely 'Glad Day' of 1780 to the grandeur and deep esoteric wisdom of *Milton* and *Jerusalem* and the Illustrations for the Book of Job. His poetry and the designs that are inseparable from it should be regarded as a series of Platonic myths or philosophic visions embodying a great thought-adventure, a mighty and memorable voyage of spiritual discovery.

It is a strange fact that Blake, who was fond of making fourfold divisions, seems to have had four great periods of illumination when he received the gift, as he would have said, of The Divine Vision. The first was connected with the death of his beloved brother Robert and the outbreak of the French Revolution. The vision that assured him that Robert's spirit lived and was happy seems to have stimulated that uprush of creative activity that led to the invention of the 'illuminated printing' and the writing of his first great poetic masterpieces, *The Songs of Innocence and Experience*. *The Songs of Innocence*, the purest lyric music, perhaps, in the English language, represent the radiant vision of his happy childhood, which came back to him with overwhelming force when he thought that he himself was about to become a father. The outbreak of the French Revolution focused his attention on the appalling evils of contemporary English society, above all on the horror of the misery and defilement of childhood in the London streets:

I wander thro' each charter'd street,  
Near where the charter'd Thames does flow,  
And mark in every face I meet  
Marks of weakness, marks of woe.

In every cry of every Man,  
 In every Infant's cry of fear,  
 In every voice, in every ban,  
 The mind forg'd manacles I hear.

How the Chimney sweeper's cry  
 Every black'ning Church appalls;  
 And the hopeless Soldier's sigh  
 Runs in blood down Palace walls.

But most thro' midnight streets I hear  
 How the youthful Harlot's curse  
 Blasts the new-born Infant's tear  
 And blights with plagues the Marriage hearse.

This is no 'gentle vision' but one of the most searching and powerful pieces of social criticism in the English language just as the famous 'Tyger' in the same collection is one of the profoundest of lyrical meditations on the mystery of evil. Blake, as we have seen, started to write an epic on the French Revolution, and the fragment that remains is a magnificent piece of poetic eloquence. Revolutionary in a much profounder sense, however, is that extraordinary work *The Marriage of Heaven and Hell* engraved in 1790. This amazing mixture of humour, irony, poetry, and profound wisdom, written partly in free verse, but mostly in terse, sinewy prose, is a deliberate challenge to the comfortable smooth conformists who called themselves Christians. The whole of conventional morality is here turned inside out; what is commonly called evil is described as 'the active springing from energy', while what is called good is 'the passive that obeys reason'. It is here that Blake proclaims his doctrine of Contraries: 'Without Contraries there is no progression. Attraction and Repulsion, Reason and Energy, Love and Hate, are necessary to Human Existence.' Here too he declares himself to be the friend of Devils and promises to give the World the 'Bible of Hell'. The specimens that he quotes, apparently from this 'Bible', of 'Proverbs of Hell' anticipate Nietzsche in their praise of heroic energy and contempt for the servile virtues and Freud in their warnings against the repression of desire:

The road of excess leads to the palace of wisdom.  
 He who desires but acts not, breeds pestilence.  
 Sooner murder an infant in its cradle than nurse unacted desires.

*The Marriage of Heaven and Hell* closes with 'A Song of Liberty', an exultant paean of faith in the Revolution, ending with the great affirmation of the sacredness of all life which is at the very centre of Blake's teaching:

Every thing that lives is Holy.

In 1793, when the golden hopes excited by the French Revolution had been dashed by the Jacobin Terror in France and Pitt's campaign of repression in England, the Blakes went to live in Hercules Buildings, Lambeth. The seven years which they spent there were most prosperous in Blake's life from the worldly point of view, but they were also a time of intense creative activity and agonizing spiritual exploration. At this time he painted some of his greatest

pictures and wrote and engraved the series of works sometimes called the Lambeth books, *The Visions of the Daughters of Albion*, *America*, *Europe*, *The First Book of Urizen*, *The Book of Ahania*, *The Book of Los* and *The Song of Los*. It is in these books that Blake first formulates his peculiar mythology. He now saw that his business was not with the external world, but, as Margoliouth says with 'the workings of the mind, past, present and future'. To do this he had to invent a new set of terms to describe mental realities. Modern psychology has done something similar with its invention of terms like Id, Superego, Censor, Animus, Anima and Shadow. Blake, however, did not use the abstractions of the scientist, but, as I have already explained, thought in terms of vision and symbol. He sees the mind, which for him is the whole universe, divided up into four powers which he calls the four Zoas: Tharmas representing the body or instinct, Luvah passion or emotion, Los or Urthona imagination, and Urizen reason or intellect. The mythology includes other figures too like Orc, the youthful spirit of revolt, Vala, the female figure representing Nature and Jerusalem divine womanhood. All these figures have a life of their own in Blake's longer poems, which are indeed symbolic stories about their adventures and destiny. Parallel to this mythology is Blake's peculiar psychological scheme according to which the mind is divided up into the Spectre or rational selfish, masculine element and the Emanation or feminine, imaginative element. Blake admired Milton immensely but he believed that Milton had been mistaken in the account of the Fall that he gave in *Paradise Lost*. Blake saw the Fall as the result of the disintegration of the human mind through the separation of Urizen or the intellect from Los (Imagination) and Tharmas and Luvah (instinct and emotion). In the Lambeth books, more successfully perhaps through the designs than the poetry, he makes his first attempt to embody this conception of the Fall. Then, when he was working on a great series of illustrations for a projected edition of the popular eighteenth-century poem, Young's *Night Thoughts*, in 1796-97 there came to him his second great illumination of the Divine Vision, enabling him to prophesy that the Fall would be followed by the redemption, a resurrection of humanity in the person of Albion who is at once England and Everyman. This takes place through the crucifixion of Jesus, who is the Divine Imagination signifying the destruction of selfhood and the bringing about of a new harmony of the four Zoas and a reintegration of the mind. To express these ideas or rather visions it was now necessary for him to write a work which should be a *Paradise Lost* and a *Paradise Regained* in one. His first attempt to produce such a poem was the long poem called first *The Four Zoas* and then in a revised draft *Vala*. He never satisfied himself sufficiently with this poem to engrave it, and he put the manuscript aside in 1800 when he accepted William Hayley's invitation to move to a cottage on his estate at Felpham in Sussex. Blake eventually found Hayley intolerable and only stayed in Felpham for three years, but the time he spent in Sussex was not wasted. He was deeply moved by the beauty of the landscape and also stimulated by his clashes with Hayley. These experiences seem to have produced his third period of illumination, finding expression in his two great epic poems *Milton*

and *Jerusalem*. *Milton*, started at Felpham, but finished and engraved after Blake's return to London in 1803, recounts the heroic action of the spirit of Milton, which 'unhappy though in heaven' decides to descend into the deep (which is also William Blake's own personality) to redeem his 'sixfold emanation' or the sexual part of his mind which his rigid Puritanism had caused him to deny in his earthly life. In Ulro or Hell he meets Urizen, or Satan, whom he recognizes as his own selfhood, which must be 'annihilated' or rather redeemed through forgiveness. The Preface to this poem contains the famous lyric, popularly, though incorrectly, called 'Jerusalem', known to thousands of people who have never heard of Blake through its use as a hymn with the musical setting by Sir Hubert Parry. The epic poem *Jerusalem* written and engraved between 1804 and 1820 is the last of Blake's long poems and the most elaborate and complete embodiment of his doctrine. It is also the most splendid and richly decorated of his illuminated books, consisting of one hundred plates among which



[By courtesy of William Blake Trust]

*Albion adoring the Crucified Christ. Jerusalem* (Stirling Copy), Plate 76. (Photograph of the reproduction in *Jerusalem* by William Blake, *Facsimile and Text, Limited Edition*. Trianon Press for the William Blake Trust, 1951)



are some of his greatest designs. Here the plan sketched in *Vala* is carried out on a grand scale. The mythology is very complex but the central theme is the Fall and Redemption of Albion leading to his final reunion with Jerusalem, the divine womanhood. The crisis of the poem is the dialogue between Albion and Jesus in the Fourth Chapter addressed to the Christians. The answer of Jesus to Albion, who has questioned the need of the sacrifice of 'Self for another', is the most sublime expression of Blake's visionary and undogmatic Christianity:

Jesus said: 'Wouldest thou love one who never died  
For thee, or ever die for one who had not died for thee?  
And if God dieth not for Man, giveth not himself  
Eternally for Man, Man could not exist for Man is Love  
As God is Love: every kindness to another is a little Death  
In the Divine Image, nor can Man exist but by Brotherhood.'

The seventy-sixth plate of *Jerusalem*, representing Albion facing the crucified Christ, is the perfect pictorial counterpart to these lines. Sir Anthony Blunt has pointed out that the pose of Albion in this picture echoes the attitude of the figure on the Cross. This is Blake's subtle way of saying that Albion and Jesus are in a sense identical and that the Crucifixion is no mere historical event but a symbol of the annihilation of the self in every human being.

After *Jerusalem* Blake seems to have written little poetry. In 1821 he and his wife moved to two rooms in Fountain Court off the Strand called by his young admirers, the Ancients, the House of the Interpreter. Here he lived for the last six years of his life when he received his fourth and final illumination of the Divine Vision, the main product of which was the great series of designs for the Book of Job commissioned by John Linnell. These are much more than mere illustrations to the text. As Joseph Wicksteed has shown, they are a complete reinterpretation of the ancient Hebrew myth, a new poem without words in the form of a series of pictures. The fourteenth of these designs, 'When the morning stars sang together and all the sons of God shouted for joy', is perhaps the most radiant and inspired of all Blake's pictures. One of his greatest qualities is his sense of the eternal miracle of creation. In this design we are made literally to see that miracle, as Wicksteed has said, 'forever going on in the Bosom of God the Human Imagination'. At the time of his death he was working on another great series of illustrations for Dante's Divine Comedy, and the drawings which he made for this series are not inferior to the Job illustrations in imaginative power and poetic insight.

The Divine Vision remained with Blake to the end. 'Just before he died', wrote George Richmond, 'his countenance became fair, his eyes brightened and he burst out singing of the things he saw in heaven.' By him was his wife, the patient and faithful Catherine, and his last drawing is said to have been a sketch of her as she sat by his bedside.

William Blake, then, is to be remembered not only as the great artist, unique perhaps in his dual achievement as poet and painter, but as the Visionary Man, the prophet in the truest sense of the word. His formulation of the doctrines of



*When the Morning Stars sang together and all the Sons of God shouted for Joy.* (Photograph of reproduction of water colour by William Blake in the Pierpont Library, New York.)

the truth and holiness of the imagination and the Divine Humanity at the very beginning of the industrial age has more than a mere historical interest. These doctrines have a peculiar relevance to the human situation in our own time when the gospel of Urizen, the rational selfhood divorced from imagination, against which Blake's life was a perpetual struggle, has brought us to the very verge of race suicide. D. H. Lawrence once described modern man as 'enslaved by civilization'. Blake's visionary doctrine shows us a way to free ourselves from that slavery. Samuel Palmer, who knew Blake well in his old age, described him in the following memorable words:

He was a man without a mask; his aim single, his path straightforward and his wants few; so he was free, noble and happy.

We stand badly in need of freedom, nobility and happiness to-day; we shall find them in Blake's art and doctrine. If we are asked why we honour his memory in 1957, the answer is to be found in the great line in his *Jerusalem* :

Because he kept the Divine Vision in time of trouble.

## DISCUSSION

THE CHAIRMAN: This audience can seldom have listened to a more illuminating address about Blake than the one it has just heard. The Sunday before last a Professor of Poetry, writing in a Sunday paper, announced that all Blake's major works were totally unreadable and, on the strength of not having read them, added that Blake was 'dotty'. Nobody here to-day, I think, will ask the lecturer whether or not Blake was mad. That, as Professor Pinto says, is an opinion no longer held by any competent authority who has really studied Blake's writings. You have heard more to-day about the writing of Blake and his ideas than you have about his paintings. That is another very large side of Blake which obviously the lecturer could not deal with in forty minutes; but it is important to remember that you can never separate what Blake wrote from what he painted, and his illuminated books have always shown extremely well how he could integrate his writing and his painting into one splendid whole. Professor Pinto has sufficiently emphasized that particular point.

MR. A. V. BURBURY: Would Professor Pinto care to say anything further on the submission made by W. P. Witcutt (in his *Blake*, Hollis & Carter, 1946) and greater authorities, that Blake, when he said he saw by direct vision these personalities who reason in his prophetic books, was seeing something corresponding very closely to what Dr. Jung and his school have subsequently found to be archetypal elements in the makeup of the human soul? The extent in fact to which his vision does correspond to those interpretations?

THE LECTURER: I do not know a great deal about modern psychology, but the suggestion seems to me to fit in very well with Blake's kind of vision. I believe Miss Kathleen Raine in her forthcoming book is going to deal with that subject in considerable detail. I think that Jung is probably the modern psychologist who is most helpful in the interpretation of Blake.

MR. BURBURY: Miss Raine was lecturing on Blake lately to the Poetry Society, and to the Pastoral Psychology Guild at Oxford last year. She does not agree with Mr. Witcutt, in whose works I first found this interpretation. She protests strongly at any suggestion that Blake was merely guided by inner vision, maintaining that he was highly cultured and educated, knowing intimately the many Classics which he had to illustrate.

MR. C. G. MARTIN: Did Blake care very much whether he was understood in his own time? Does Professor Pinto think that makes a difference to Blake's work, particularly his poetry?

THE LECTURER: This is a very good question. Like all great artists Blake must at times have felt keenly his neglect by his contemporaries. In fact, it can be seen from his writings that he did. But I should say that he did not care very greatly. I do not think any real great artist does. Blake probably had an inner conviction that ultimately he would speak to the whole of humanity. It is a complex question. What you are asking really is about the relationship of the unknown or obscure part of his work to his potential audience. Blake had a wonderful serenity, such as comes, I think,

from inner strength of imagination. In some ways, paradoxically enough, it may have been a good thing that he was neglected in his lifetime, because he had a handicraft by which he could live. He lived by his work as an engraver and, earning his living in that obscure condition, he was free to write and to make designs in the way he wanted. He did not have to write in order to earn a living in the way that Dickens, for example, had to. There is an important place for a great pioneer like Blake, a man who was a long way ahead of his time. Perhaps in a way it is better for such people if they are not popular artists, provided that they are otherwise able to live. Blake was able to earn his living by means of a handicraft. I think that is where he was better off than the other great English Romantic poets, they could not do that. The figure he always reminds me of is Spinoza. Spinoza was in an equally obscure position and earned his living as a maker and polisher of lenses.

MISS MABEL D. LAPHORN: May I ask whether it was Francis Bacon or Roger Bacon to whom Blake took exception?

THE LECTURER: Francis Bacon. Roger was very little known at that time.

MR. BARRY SULLIVAN: In India and further East I notice there is a remarkable and growing interest in Blake. I wonder if you could suggest reasons for this?

THE LECTURER: There has been a particular interest in Blake shown in both India and Japan. I think both his thought and his art have great affinities with Hindu thought, about which he knew something. In Blake's time some of the great Hindu scriptures were translated for the first time by Sir William Jones and Sir Charles Wilkins, and Blake certainly had read those translations. I think he had a natural affinity with the Hindu thinkers and there was also this strange, quite unaccountable affinity between his art and oriental art. So I think it is not surprising there is this interest in Blake in oriental countries.

MRS. GALLOWAY: May I ask if you think Blake's work was affected as much as Wordsworth's, by the immense pressure of the revolution?

THE LECTURER: That raises another very big question. I think the French Revolution had just as great an effect on Blake as on Wordsworth. I think it was a very important event in his life. There is a parallel here. Both men were enthusiasts for the revolution at the beginning, and both of them were later to some extent disillusioned; but Blake did not abandon his revolutionary views to quite the same extent as Wordsworth. Blake remained a revolutionary to the end, but in the latter part of his life he considered that politics were quite useless. There is a famous passage where he said it was quite foolish for his countrymen to engage in politics and that Houses of Commons and Houses of Lords were something quite inhuman, something not like humanity. Blake believed that the only kind of revolution which could succeed was the revolution within the mind.

MR. HORACE SHIPP: Does the lecturer think that Blake was influenced by the writings of Swedenborg?

THE LECTURER: Blake certainly knew Swedenborg's work very well. He was partly influenced and partly repelled by Swedenborg's works. He saw that Swedenborg's writings contained elements of great importance, but he also thought that Swedenborg had been overpraised and that he was appointed to correct many of Swedenborg's errors. He called him 'Swedenborg, strongest of men, the Samson shorn by the Churches'. There was certainly a connection between Blake and Swedenborg.

MR. A. V. BURBURY: There is a story that Blake's father was a Dublin Irishman. Has this any basis of fact?

THE LECTURER: I think that story has now been disproved. W. B. Yeats was anxious to prove that all great poets were Irishmen, but I think the evidence that he brought forward was not satisfactory at all. Blake called himself 'English Blake', and I think that is a sufficient answer.

LADY COHEN: Did Samuel Palmer have great influence upon Blake?

THE LECTURER: It was the other way round. Blake had great influence on Samuel Palmer, who was a much younger man. I think the little landscape designs that Blake made for Virgil's *Elcogues* had a great effect on Palmer, which came out very strongly in his beautiful visionary landscapes. Samuel Palmer was really a kind of disciple of Blake.

LADY COHEN: I am particularly interested because Samuel Palmer lived for many years in Water House, Shoreham, which is still occupied and where Blake is reported to have visited during the last year of his life.

THE CHAIRMAN: Professor Pinto kindly stated that I knew more about Blake than anybody else. It is not true, of course! All I have done is to provide the materials on which scholars can work. It is people like Professor Pinto who then bring to our minds a keener sense of Blake's message, and really supply the structure on which Blake's message is founded. I wish to express the thanks of the audience and myself to Professor Pinto for his extremely illuminating address.

*The vote of thanks to the Lecturer was carried with acclamation.*

DR. R. W. HOLLAND: I have the privilege of asking you to accord to our Chairman this afternoon a very hearty vote of thanks. We hear so much these days about the technician who is not properly educated, who is without culture. Here we have a technician of our earthly bodies prepared to assist in our spiritual welfare. Sir Geoffrey Keynes has more than a nodding acquaintance with many great men of letters, from John Donne to Rupert Brooke, passing Thomas Browne (and the subject of Professor Pinto's lecture) on the way. He may refute Professor Pinto's statement, but it is perfectly true, because without the materials there could be no building.

*The vote of thanks to the Chairman was carried with acclamation, and the meeting then ended.*

# SOCIAL DEVELOPMENT IN BRITISH OVERSEAS TERRITORIES

*A paper by*

W. H. CHINN, C.M.G.,

*Adviser on Social Welfare to the Secretary of State  
for the Colonies, read to the Commonwealth Section  
of the Society on Thursday, 28th November, 1957,  
with Lionel Elvin, Professor of Education in Tropical  
Areas, Institute of Education, University of London,  
in the Chair*

THE CHAIRMAN: We are all aware these days of the very rapid political changes that are taking place in British Overseas Territories, and we know that in general their aim is nation-building. We are also aware—though perhaps more dimly—that any such political development which is not supported by social development is likely to be disappointing. It is that side of the problem presented by our Overseas Territories that we are to discuss to-night.

We are very fortunate in having as our lecturer a man who speaks with real authority. Mr. Chinn began his career in this country as a Probation Officer, and after some years in that occupation he went to work in Palestine, where I believe he became the first Secretary of the Social Welfare Department of Palestine, as it then was. Since 1947 he has been Adviser on Social Welfare to the Secretary of State for the Colonies. In sum, he is the person whom we should, perhaps, most wish to hear on the subject before us.

*The following paper was then read:*

## THE PAPER

It is usual to begin a talk of this kind by attempting to define its title. I hope that before I finish you will have some idea of what is meant by social development, but I should make clear at the outset what is meant by the term 'British Overseas' territories for the purposes of this talk. In general they are those countries for which the Secretary of State for the Colonies is responsible. I have taken the liberty of quoting Ghana for reasons which will subsequently become apparent and not because I am unaware of its status as an independent member of the Commonwealth.

British Government policy for its overseas territories has frequently been stated as advance on a broad front embracing economic, political and social development. These three aspects of development are usually stated in that order and do in fact represent a logical sequence of priorities in any development programme. Initially the purpose of British Colonial administration was a very simple one—to maintain a framework of law and order within which the resources of the particular territory could be developed by commercial enterprise. For this



purpose a paternalistic régime based on the principle of indirect rule was appropriate, simple and reasonably efficient. Under this system development depended upon outside capital and initiative, which exploited the natural wealth and resources of the country primarily in its own interests. It was an extension of the expanding economy of the industrial revolution. There was no concern with welfare or social services, and neither Government nor commercial interests intervened consciously in the way of life of the indigenous population.

In this respect economic development in overseas territories followed the pattern in the West, where improvements in machinery seemed more important than improvement in living conditions; scientific progress and the accumulation of wealth were ends in themselves. We are all aware of the social evils which resulted. None of these evils was apparent in the early days of Colonial development. Until comparatively recently only a small section of any overseas community was directly affected by these trading contacts with the outside world.

Perhaps the greatest initial influence was that of the Christian Churches, whose missionaries often presented the first contact with western ideas. In most territories also the missions were responsible for introducing a system of education largely designed to ensure a supply of staff for the new services required by the Churches themselves, government, and commercial interests—catechists, teachers, clerks, etc. But that is another story; it is mentioned here, not only because the Christian Churches were the pioneers of social service in many overseas countries, but to emphasize their importance as agents of social change.

Development during what might be called the Colonial period was then dependent on commercial enterprise. It was entirely economic in character and was primarily directed to further the interests of individuals and groups foreign to the territory. But with the establishment of industrial plants, mining concerns and plantation farming the situation changed. Europeans settled in the healthier countries, towns were built and labour was required to work for wages in districts far from the tribal home.

Government had to provide services for the growing towns; regulations had to be made to govern conditions of labour, health services provided and education extended to meet ever-increasing demands for a growing variety of skills. All this was expensive, and ways and means had to be found to raise money from a people unused to a money economy. This meant increased production of cash crops from peasant farmers, and agricultural departments were set up to help and advise the farmers. Taxes had to be collected, and new forms of political organizations were introduced to replace or modify the former policy of indirect rule. And so the original concept of Colonial development began to change. Although still mainly economic in character, development was directed to the improvement of conditions in the territories; to strengthen the economy and expand the social services. In recent years a new and powerful element has transcended all other aspects of development, namely, nationalism. Of the three essentials to balanced development, economic, political and social, the political has at present the greatest force.

Now, of the some 70 million people living in British overseas territories in

various stages of development and representing a tremendous diversity in habits and traditions, 90 per cent live in rural areas. That is to say that the vast majority are living in a social structure consisting of small communities within a tribal or family framework according to tribal law and custom. But they are all experiencing to a greater or lesser degree a process of change common to all so-called under-developed countries.

Traditional ways of life, tribal laws and customs everywhere show signs of breaking down and in certain areas this process is well advanced. In saying this, it is important to realize that change is inevitable; we can and should try to direct it, but any attempt to prevent it—to return to what is often nostalgically thought of as a happy state of nature—is doomed to failure. Contact with western ideas, the work of the Christian Missions and the imposition of the British Judicial system have all contributed to widening the gulf between the elders and the young men, have affected the status of women and have left large sections of the population of the territories in that indeterminate state where they are easily susceptible to political propaganda and emotionalism.

This aspect of change might be considered as the result of a clash of cultures which could be directed and controlled through educational methods and the growth of political responsibility. But in recent years new and much more revolutionary processes have been at work in British territories—namely, rapid economic development and the policy of hastening the advance of overseas territories towards full self-government within the Commonwealth.

It is not generally realized just how recent is this economic growth. Thirty years ago there was no Copper Belt in Northern Rhodesia; before the war there were very few large-scale agricultural schemes, no hydro-electric schemes, and bauxite and other mineral wealth had hardly been discovered. The point I want to make is that these countries are now going through an industrial revolution, telescoped into about one-tenth of the time occupied by the European industrial revolution. At the same time they are having to absorb an entirely new culture and have no natural background of tradition and custom to fit them for the western form of civilization which they so desire. We not only had more time to adjust to changing conditions but we did so within a social and political setting which allowed for adaptation and the development of a sense of personal and public responsibility. Even so, as has already been indicated, we made a pretty sad mess of many aspects of industrialization. Some of the mistakes we made are being repeated in our overseas territories, where their effect is even more devastating to the social structure. The growth of towns, migrant labour for mines and agricultural estates, the rapid change to a money economy and many other influences have produced problems almost overnight for which no government has found satisfactory solutions and the implications of which are as yet imperfectly understood.

Far too little attention has been paid to the effect of all these changes on the human beings on which they depend and in whose interests they should be operating. Development in certain directions has been so rapid and contact with western ideas so recent that there has been little time to build the social

foundations on which progress should be based. And, during the last ten years, the strength of nationalist feeling has added the task of preparing the people in the shortest possible time for full responsibility for the conduct of their own affairs.

At the beginning of this talk I referred to the British Government's policy of development on a broad front, embracing economic, political and social development, and suggested that there was some significance in the sequence. Political advance is only possible in an economically sound State, and social services not only have to be paid for but can only operate effectively in an accepted political setting. This may be logical, but unfortunately we have been caught up in events and time is definitely not on our side. Concentration on economic development and the strength of political feelings have overshadowed the need to ensure that the overall development programmes are designed to suit the general well-being of society and the individual. We all know what is meant by economic and political development, but where does social development come in? Social development must obviously form an integral part of the general process of development in any country; it is not something apart but is an aspect, the human aspect if you like, of the progress of the people. In this sense and in the words of the Report of the Colonial Office Conference on Social Development held at Ashridge in 1954, 'It [Social Development] means nothing less than the whole process of change and advancement in a territory, considered in terms of the well-being of society and the individual . . . it covers and informs the economic, social, political and cultural fields.' This philosophical aspect of social development is all very well, but how can it be translated into practical action for building self-reliant communities willing and able to play an active part in their own development and to use intelligently the new resources of our scientific age? Is it possible by careful planning to avoid the social evils resulting from rapid change? And can services be provided to remedy social problems as they arise and help those individuals who are unable or unwilling to fit into the new pattern of society?

There are, I submit, two meanings implicit in the term 'Social development'. The Ashridge definition which sees it as the whole process of change and advancement in terms of social well-being, and the functional sense in which certain measures and skills can be applied to communities and individuals in order to achieve desirable social ends. These two aspects are not exclusive. In the broader sense social development implies a common objective for all agencies concerned with development coupled with co-ordinated action. In the functional sense it is also vitally concerned with co-ordination and a common approach, but in this sense the emphasis is placed on the need to associate the people themselves with the efforts made on their behalf. This implies not only co-ordinated action but a change in attitude to all aspects of development on the part of both the agencies concerned with development programmes and the people themselves.

How is this to be done? How can social development programmes be made effective in territories often too poor to provide even basic services on an adequate level? The problem is further complicated by the nature and structure

of the public social services in many overseas territories. The emphasis is too often departmental. Departments of Education, Health, Agriculture, Social Welfare are each concerned with specific functions and there is little co-ordination of effort or policy. It is also becoming apparent that the traditional social services, far from solving the problem, are liable to add to it. Formal education breeds dissatisfaction with a former mode of life and may stimulate the drift to the towns; it also widens the gap between the generations; health services add to the burden of over-population in some areas; agricultural schemes often seriously affect the traditional pattern of rural life and social welfare services encourage dependence on external assistance. We have, in fact, arrived at the stage when development in any field is liable to aggravate rather than ameliorate the disruption caused by rapid social change. A policy of social development should ensure that all these social services are co-ordinated at field level. The people can only understand, appreciate and use them effectively if they are brought fully into the picture at the planning stage and are encouraged to play an active part in the implementation of agreed plans. Ideally there should also be a continuous evaluation of the effects of these services on the individual, the family and the community.

In a rapidly developing society it is obviously difficult to achieve that degree of co-ordinated effort which would ensure progress without a measure of social disruption. While a policy of social development should aim primarily at co-ordination and a common approach, there is an immediate need to provide special services in an attempt to fill some of the gaps in the social services—gaps which are likely to exist for some time to come in the programmes of many government departments. In this sense a programme of social development has a separate function—to provide a temporary and rudimentary extension service for the technical departments.

But if it is agreed that progress depends on the co-ordinated effort of all concerned in development, including the people themselves, then steps should be taken to bring about co-ordination. It will not happen automatically, nor as the result of a statement of policy. It has to be planned at all levels; the officers of all agencies concerned with development have to be trained in a new approach in the application of technical skills; the people have to be willing and able to co-operate in schemes for their own betterment, and provision has to be made to cushion the effects of change, to care for the casualties and deal with the social problems which seem inseparable from economic development.

There seems at this stage, therefore, to be a need for a distinctive social development organization whose activities might be grouped under three heads:

- (i) to prepare the ground for and to supplement the work of the technical departments of government, and through group activities and communal effort concentrate attention on the human aspects of development;
- (ii) provide constructive measures to build a sense of community and as far as possible to prevent disruption and its consequent social problems;
- (iii) provide remedial measures to deal with problems as they arise and

initiate services to help those individuals who are unable or unwilling to fit into the changing pattern of society, or who fall by the wayside.

These three aspects of social development in the functional sense receive their practical application under the headings of Community Development and Social Welfare.

The term community development was adopted at the Cambridge Summer Conference on African Administration in 1948 to describe a method of approach to local administration which aimed at developing the initiative of the individual and the community in schemes for promoting their own betterment. It has been defined as 'a movement designed to promote better living for the whole community with the active participation and on the initiative of the community'. The principles of community development were, of course, not new in 1948 when the term was first used. There had been various experiments in village betterment, forms of community organization and self-help schemes which associated groups of people in development programmes. What is new is the concept of community development as a movement, the principles and methods of which are of universal application. Even so, community development is often used to describe differing methods of approach and there is not as yet, and by the nature of the subject there may never be, a precise definition applicable in all circumstances. For example, the United Nations place the emphasis on 'development' through community effort with the accent mainly on material advancement. There is also considerable divergence in methods used to stimulate initiative in the community from what may be called the 'authoritarian' approach through an outside agency, to complete reliance on the wishes of the people—their 'felt needs'. All these methods may use the principles of community development but, as T. R. Batten points out in his recent book *Communities and their Development*, they may not all equally apply to every situation and in every community. 'Different communities have different needs and the same community has different needs at different times. It is in finding and meeting these needs that agency aims and methods should be related, and it is by success in doing so rather than by adhering to fixed principles or dogma that community agencies must justify what they do.' The differences in method and application can be seen in British overseas territories, but recent trends place the emphasis more on the word 'community' than on the word 'development'; we are beginning to think more of development *of* communities rather than *for* or even *by* communities.

In helping people to adapt themselves to a changing form of society it is essential to find effective ways of stimulating, helping and teaching them to adopt new methods and to learn new skills; to help them to adapt their way of life to changes they accept or have imposed upon them; and to ensure that the spirit of community is not destroyed.

An additional and extremely important aspect of community development is the part it can play in building new communities. It was first used naturally in the rural areas where the bulk of the population of overseas territories live. Not enough attention either in research or experimentation has been given to the



constructive side of social development in towns, mining areas and plantations. In nearly all cases these conglomerations of people are of forced growth and recent origin. They present a problem of creating communities out of often widely differing ethnic and religious groups. Community development can help to foster means by which the individual in a new and strange environment can discover a sense of belonging, new loyalties can be created and a forceful public opinion built up.

It is thus through the application of community development methods that the first two requirements of a social development programme can be met. It was suggested that these were: to prepare the people to accept and use intelligently the services available to them and to ensure that development took fully into account the human aspect; and to build a sense of community and mitigate the social ills arising from economic development.

The third requirement was to provide measures to deal with social problems as they arise. Such problems as delinquency, destitution, the care of children, the handicapped and the misfits; problems dealt with by social case-work methods. There is a close relationship between social welfare and community development. Social welfare is not only concerned with remedial action but it also has an important constructive contribution to make by applying group work methods in both urban and rural areas. Community associations and centres, boys' and girls' clubs and youth associations generally, the organization of sport and athletics, all of which come under the general head of welfare, are essential elements in social development. How are these requirements for social development being met?

There is not time in a short talk to describe in detail the pattern of social development organization in thirty or more territories, but the examples which follow indicate broadly what is happening in some of the larger territories.

Ghana has had a separate department dealing with various aspects of social welfare and community development for more than ten years. It is divided into two sections each under an Assistant Director dealing respectively with social welfare and community development. The Social Welfare section is responsible for administering the probation system, institutions for young offenders, remand homes and hostels, and for providing a case-work agency, particularly in the towns. It encourages voluntary societies and effort in a number of projects, particularly the provision of crèches for the children of working mothers and the activities of community centres.

The Community Development section works mainly but not exclusively in rural areas. Each district has its community development officer with subordinate staff responsible for a large variety of schemes and projects from literacy campaigns to the building of roads. The officers work through the local government authorities to which, in some areas, they act as advisers on development programmes. An infinite variety of local projects wanted by the people is undertaken through aided self-help. Such projects are intended to build up a responsible attitude in local affairs. In addition, the community development officers help to strengthen the cultural and recreational life of the villagers through organizing



group activities in community centres and village halls, some of which have been built by the people themselves. They are also fully aware of the value of ceremony, emulation and incentive in helping to build a sense of loyalty to a wider entity than just the local group. Full use is made of mass ceremonies involving traditional colour and pageantry reinforced by village brass bands, badge and certificate presentations, etc. Such occasions provide opportunities for people from neighbouring villages and towns to compare achievements. Football league and brass band competitions have become a feature in many areas, and the general policy of the Department is to reach a balanced development so that village life may be fuller and more satisfactory.

In addition to stimulating local projects the Department co-operates closely in the extension work of other departments of Government. It has a unique experience in conducting big campaigns built up from its early concentration on mass literacy and making use of its special section for audio-visual aids. The Social Welfare section, in addition to its remedial work, has conducted useful studies in particular social problems, and it co-operates with the Community Development section in activities such as youth work and community associations in the larger towns. The Department has a large staff responsible directly for implementing government social development policy in the field. When working on campaigns in which other departments are concerned, joint training facilities are provided for field staff in the Department's Rural Training Centres which have been set up in each district. These centres also provide training for local village leaders and are an essential feature of the training programme. The Department also has its own training school, which every newly-appointed officer has to attend, and for training at a higher level full use is made of the Social Study course at the University College. Ghana provides an example of a nationally organized and centrally directed department dealing with most aspects of social development, both at the policy-making level and in the field. In this respect it has a more advanced and comprehensive form of social development administration than most other overseas territories in Africa. An undoubted factor in its success is the stimulation given by self-determination.

In East Africa all three territories, Kenya, Uganda and Tanganyika, have departments dealing with social development. Uganda, for example, has a Department of Community Development with similar functions to those of the Department of Social Welfare and Community Development in Ghana. The staff is, however, comparatively small and in the rural areas works through the District Team. This is a device aimed at achieving co-ordination between the various departments concerned with development and the people themselves. The community development officer is a member of the team and his job is to organize the voluntary effort of the people, and supervise and assist in the execution of the particular projects approved by the District Team. This method of approach undoubtedly encourages local initiative and effort in material betterment, but there is a danger that the community development officer may become so involved in the success of isolated projects that he has no time or scope to concentrate on the various methods needed to develop a real

sense of community. His main function is development of the community, and self-help projects may be only transitory if the more important but intangible aspects of social development are ignored.

This aspect of social development requires concentration on the smallest unit of society—the family. And the most important member of the family is the woman. In recent years there has been a determined effort to raise the status of women and to associate them fully with social development schemes. A feature of the work of women community development officers in all three territories in East Africa has been the establishment of women's clubs. The clubs attracted membership at first mainly through an interest in sewing, but as trained leaders became available the practice of planned programmes was introduced. The clubs are run on democratic lines and discussion with the officers and committees of the clubs led to the adaptation of work and interests to meet the wishes of the group and the needs of the community. Programmes were planned to give instruction in better living for the family; opportunities for sports and games were provided and an interest in crafts, drama and music encouraged. The approach to community development among women is thus intended to promote higher standards of living in the home through self-help and to encourage a community spirit through an active participation of club members in services of various kinds for the communities in which they live. In all territories, but particularly in Kenya, the movement is growing rapidly and the Home Economics Division of the Food and Agriculture Organization of the United Nations is co-operating with the governments concerned to provide training programmes and study fellowships.

The best example of social development through family betterment schemes is perhaps seen in the work of the Jamaica Social Welfare Commission. This is a Government body which grew out of a voluntary society—Jamaica Welfare Ltd.—set up to improve the lot of the people living in rural areas through self-help schemes using the group approach and working in small communities. The Commission now deals with social development in the constructive sense in both town and country. It works as far as possible through the family, stressing the importance of a stable family life. The Home Economics approach is used, and 3-F (food for family fitness) campaigns, self-help house-building and other aspects of home-making are stressed. Jamaica and the West Indies present peculiar problems not met with elsewhere which cannot be discussed here.

Special problems are also involved in the large mainly urban territories such as Hong Kong and Singapore. Both these territories have large departments of social welfare responsible for every aspect of social development. An important feature of both is the co-operation achieved between voluntary organizations and government. Thus, in Singapore, children's feeding centres set up to deal with distress after the Japanese occupation have now developed into Neighbourhood Centres managed entirely by the people themselves. In Hong Kong the Social Welfare Officer encouraged nearby residents to take an interest in the work of the welfare centres and so started a revival of the Kaifong, a kind of neighbourhood association common in the old China. There are now over

twenty Kaifong Welfare Associations in the Colony, with total membership of some 300,000, carrying out voluntarily a wide variety of social services, from school and medical services to the provision of playgrounds. They also concern themselves with encouraging a civic spirit, making representations to government on necessary improvements, etc. There are now women's sections of the Kaifong Associations which run domestic science, baby care and literacy classes for women in their districts, provide free maternity care for needy expectant mothers and also assist in the formation of women's clubs.

In all overseas territories every effort is made to encourage voluntary societies and in most of them the overseas work of many voluntary bodies centred in the United Kingdom, such as the Red Cross, St. John Ambulance Brigade, Young Men's Christian Association and Young Women's Christian Association, the Boy Scouts Association and the Girl Guides Association, etc., is a feature of social development. The majority of overseas governments assist voluntary bodies through grants-in-aid, and in some a useful working partnership has been established by setting up councils of social service. The Churches are also actively turning their attention to social development, and the whole question of the part they can play in co-operation with governments in social development is at present being discussed.

These examples have had to be selective, and very inadequately indicate some of the work being done in territories where programmes of social development are carried out as a result of government policy.

But even in those territories where social development work is reasonably well established and has proved its value, much of the work is still experimental. Community development is a dynamic movement: it can never become static or stereotyped, and we still have a lot to learn about its methods of application. Social work methods successful in the West have to be adapted to meet new situations and problems in developing countries. We are still some way from achieving co-ordination of policy and practice, but it can be said that community development has shown the value of co-ordinated effort and the importance of carrying the people with us in development programmes. Not every technical and professional department, nor their field officers, is prepared to admit the need for new methods, and it is too much to expect that every field officer in such departments can be easily and quickly turned into a community development officer. Experience has shown that there is a need for specially trained officers to initiate, stimulate and direct community development policy, and that these officers have an executive function in certain fields. For example, they should be expert in informal adult education and the use of visual aids; have the ability to organize group activities; have a knowledge of social administration and above all be fired with the unshakeable belief in the importance and possibilities of their job.

The organization of the work of these officers is still a matter of some controversy, but from what I have seen of their work on the ground I am convinced that they can only operate effectively as members of a separate department and not as isolated units attached to the administration. The very nature of their

work implies co-ordination, so there should be no danger of a new departmentalism. In fact, the presence of community development officers of the right type in a district is the surest way to obtain co-operation and co-ordination from the officers of other departments. There is, in practice, little difficulty about working together at field level; the unsolved problem is to obtain co-ordination at policy-making level.

#### CONCLUSION

Nearly every territory is now giving increasing attention to the social aspects of development. All territories have some form of social organization, even if it be only an attempt to deal with particular social problems. The idea of community development has been accepted by all territories, but in this, as in so many other fields, progress is often held up by lack of trained staff. Community development and social welfare officers are a new phenomenon in overseas territories; they are building up a new profession, but in doing so have to compete with the older-established departments for the all too limited supply, not only of money, but of suitable staff. Again, training of officers for social development work is not as yet established on a professional basis, but this is too big a subject to embark on now.

I have tried to show the need for social development in these growing territories and the value of community development and social welfare. There is no doubt that these new techniques, although still in the process of evolution, have already contributed a great deal to redress the balance in favour of social development. By their use the people are being stimulated to help themselves and the traditional government services are being reinforced and to some extent reorientated. An intensification of effort along these lines, an effort shared by everyone concerned—voluntary workers and organizations and the Churches—will ensure the building of a sound social structure able to adapt to changing conditions and to cushion the effects of rapid change.

*The paper was followed by a showing of the film Progress in Kojia Krom.*

#### DISCUSSION

THE CHAIRMAN: If my memory is right, Mr. Chinn said that it was easier to obtain collaboration between departments at the practical field level rather than in matters of devising policy. Could he explain why that should be so, and suggest remedies?

THE LECTURER: I think the reason is this: that people who are working closely with others in the same field realize, by consultation amongst themselves, what ought to be done, and very often do it; but it is sometimes difficult for people to get approval for what they do in the field from the Heads of their Departments if this does not happen to be part of Departmental policy. I can give an instance of that, where a community development team was operating in a certain area helping to develop welfare for women. One of the things they discovered the people needed was a better midwifery service, so they gave native women simple courses in midwifery (I may say that the Medical Officer was seconded by his Department to the development team, so this was done at official level). But when the head of the Department heard that a midwifery course was being undertaken he ordered it to be stopped immediately on the ground that the only people who can take midwifery courses are qualified

people under the auspices of the Medical Department. This difficulty was easily overcome by turning the midwifery group into a women's club and then continuing the instruction to members! This is the kind of thing which is sometimes liable to happen when there is a stereotyped departmental policy. It is not always realistic by the time it gets to the bottom.

MR. J. C. PARHAM: We have heard of the work done by special departments dealing with welfare, but does the speaker think that any part can be played by the average Englishman who goes abroad?

THE LECTURER: Travelling abroad or working in some other field? Not a government officer, you mean?

MR. PARHAM: Working in some other field. Not a government officer.

THE LECTURER: Yes, I do. One of the problems in many of these territories which are developing is the need to ensure that men coming out from the United Kingdom or any other country to work for long or short periods are adequately informed about the countries they are going to so that they can understand the people with whom they are going to work. There is an Overseas Service Course in this country which has been set up to orientate people who are going out to various kinds of jobs overseas—not government jobs necessarily, but in commercial firms. The course is designed to give them some idea, not only of how they should behave in a different country, but also of what opportunities there might be for them to take part in the life of the country. I may say that this happens much more often than we hear about. For example, I have seen in Singapore British servicemen playing a very active part in the boys' clubs, particularly if they have some particular skill, in boxing or athletics, for example, and they are always ready to come forward to help with other activities. There are any number of opportunities of that sort abroad, particularly for young men, to take an active part in group work.

BRIGADIER C. GREENSLADE (Commonwealth Society for the Blind): May I ask what is the length of the course in the United Kingdom for people going overseas?

THE LECTURER: It is quite short. I think it is about a week or ten days, perhaps a fortnight.

A MEMBER OF THE AUDIENCE: Some very brief introductory courses last only three or four days.

THE LECTURER: The courses are usually designed for particular areas of the world; if they can get the people going out to East Africa and the Far East respectively in one course it makes it a bit easier, but they do not always succeed in doing that.

MRS. V. CREECH-JONES: May I ask a question on the training of the all purpose officer? It seems to me from Mr. Chinn's description of the work that has to be done in rural areas, that it might be advisable to have an all purpose officer rather than the highly specialized social welfare officers whom we know as Probation Officers, Almoners, Child Care Officers, and so forth. Is there any opportunity for that kind of training in this country? And does Mr. Chinn feel that a person who has had the specialized training of, for example, a probation officer, is sufficiently adaptable to do the general type of work which is necessary in the rural areas?

THE LECTURER: To take the second question first: it depends on the probation officer. With regard to your first question: I think you are perfectly right in suggesting that the specialist officer who cannot see beyond his speciality is of very little use in this rural work or, for that matter, in the general social work which is necessary in towns. When we interview candidates for appointment to social welfare posts overseas, we always tell them, if they have come from the case-work field, that they may get very little opportunity to undertake such work, and that they must consider themselves as general social workers prepared to do almost anything. Some of the things they have to do they are not trained for in this country. We are trying to institute a training course in this country—or at least get one of the social science



courses adapted—for this general work overseas; and we should have got further in this matter if the University Grants Committee had been more generous. There is a great deal of thought and hard work going into this question of training the all-purpose worker for work in under-developed areas and we have not yet got the answer.

MR. G. E. MERCER: For many years I was engaged in development planning in the West African Colonies and I know the difficulties that arise. Broadly speaking, I think they are normally concerned with allocation of funds—usually very scarce funds. It is an unfortunate fact that whereas economic development takes a long time to materialize (you cannot develop industries, or plantations in a year or so) social services can be developed quickly, and of course do carry very heavy recurrent burdens. So, as Mr. Chinn said, the sequence of economic development and social development is logical: in fact, it is the only way, because if a country does not earn the money to pay for these services they cannot be supplied.

I saw much of the work being done in Ghana, where there were adequate funds available at the time, and which made possible substantial progress with the social development schemes described by Mr. Chinn.

PROFESSOR R. C. WILSON (Bristol University): We in Europe tend to think of 'communities' in our own terms of towns and villages, whereas there are areas in East Africa where there are not any villages. We need to think very carefully as to what in fact is meant by a community, particularly in territories where the village is not part of the traditional pattern and yet where, quite obviously, there is rapid economic development.

I wonder whether Mr. Chinn sees any prospect of anyone doing this original thinking? The community development officer on the spot has precious little time to do anything of that fundamental kind, because the pressures of the job itself are so great.

THE LECTURER: I am very glad Professor Wilson has raised that point because it is a very real difficulty and explains to some extent the difference in method and approach to community development between West Africa and East Africa. A district team in East Africa is attempting to overcome this difficulty of a lack of a small community by working in an area which is admittedly an unnatural one. It is an administrative district which may bear little or no relation to the ordinary people, but the team have to work with groups of people who, as you know, live in isolated pockets in the district, and they may be one of the reasons why the project method in East Africa is so popular. They can get materials and they can get school buildings which will serve an area. They can open up a road between a group of people and a market centre, they can bridge a stream, they can get a clean water supply by building dams which serve a large area. It may be one of the reasons why the community-building side of development in East Africa has not been so apparent, but it is growing I think through the women's clubs. I think the women's clubs are providing the focus for a community. But I agree that much more study needs to be given to this problem. As you know, the problem in the Central Province of Kenya is whether the new village system is going to remain or not. The advantages of it are quite well known to the Kenya government. But that is another interesting case of departmentalism. One of the villages is, from the social, health, and many other administrative points of view, ideal, but the agriculturalists are not so happy about it, because the cattle are all herded in the village and they have not found any way yet to induce farmers to get their beasts back on to the land.

THE CHAIRMAN: It remains for me to say warmly to Mr. Chinn how much we have enjoyed his lecture. It has been a privilege to have so comprehensive a survey of this world-wide subject and to have it from someone who has been, if not everywhere, apparently very nearly everywhere.

*The vote of thanks to the Lecturer was carried with acclamation and, another having been accorded to the Chairman, the meeting then ended.*



# THE CONQUEST OF MALARIA

*A paper by*

GEORGE MACDONALD, C.M.G., M.D., F.R.C.P.,

*Director, Ross Institute of Tropical Hygiene, and  
Professor of Tropical Hygiene, University of  
London, read to the Commonwealth Section of the  
Society on Thursday, 5th December, 1957, with  
Sir S. Rickard Christophers, C.I.E., O.B.E.,  
F.R.S., M.B., I.M.S. (Retd.), in the Chair*

THE CHAIRMAN: No one could give us a better account of the present state of affairs in regard to malaria than our lecturer this evening. Professor Macdonald has had very remarkable opportunities for studying the progress of the disease in different parts of the world; and, in particular, I would mention the researches he has carried out in Africa and India. Eradication was a word scarcely ever used in the early days of malaria control, because we never thought that such a situation could arise. In his work, Professor Macdonald has paid special attention to the epidemiology of the disease, and he is going to tell us not only how prevention has been achieved in a very large area, but that eradication itself is in sight.

*The following paper, which was illustrated by lantern slides, was then read:*

## THE PAPER

The last decade has seen a greater change in the material state and outlook of people in tropical countries than any in past history. It is my conviction that this is no mere temporary surge, but the beginning of a movement which will be progressive, which will affect both tropical and temperate countries alike in many ways which may be good or bad, and which will be looked back upon as one of the turning points in the history of the world. Many factors will have played a part, but one of the most powerful is the ability to conquer malaria, which is going to produce effects in many fields other than that of health. My object in talking to your Society on the conquest of malaria is not to belaud or boast of successes, but to give a rational statement of how the conquest has so suddenly become feasible, of the extent to which it has been put into practice, the problems that have been met in doing so, and of the reasons why this sort of work should have far-reaching effects in apparently disconnected fields.

The disease, malaria, is a state of infection with one of four closely related protozoa which are singularly well adapted to life in man, causing severe disturbance on first invasion, sometimes resulting in death, but more commonly in survival of both host and parasite, who may live together, infective to the community, for long periods. They are also adapted to life in a limited group of the mosquitoes, the tribe Anophelini, in which they undergo a complicated process of development including the conjugation of two sexes, which takes

a couple of weeks or more for completion and ends in production of many progeny which may later be transmitted to man by a bite of the mosquito. The mosquito is, in its turn, essentially an aquatic creature, all its immature stages being spent in water, though each species is very particular concerning the nature of the water it selects for breeding purposes. It thus comes that malaria is associated with water, but with different types of water in different countries. The external cycle of the parasite is inhibited by low temperatures, transmission being limited to warm countries and to warm seasons in others. The geographical distribution of the disease is determined partly by this fact, partly by the prevalence of water, and in part by the distribution of anopheline species. It is present in all except the polar continents, but in very varying degree, causing very varying effects and damage. North America has known it almost throughout the U.S.A. and up to Canada, though latterly it has been prevalent only in the southern parts of the U.S.A. It is ubiquitous throughout central America, though there are only a few places where there is a constant repetition of intense infection and there are local foci of severity throughout the tropical parts of South America, though the disease does not extend into the southern temperate parts. In northern Europe malaria is largely a matter of history, but quite recent and interesting history: it played a significant rôle in the Napoleonic wars, defeating the Walcheren expedition; it was widespread up to the last century; it last occurred as an epidemic in England in 1918 in the Isle of Grain, on which Shellhaven is now sited, and in Holland as late as 1946. In southern Europe and the Levant the picture is different. From the times of ancient history till ten years ago malaria was one of the great dominating characteristics of the Mediterranean lands, gravely influencing agriculture and the welfare of the people from southern Spain to Turkey and the Levant, giving a challenge which no ruler could ignore—Mussolini, for instance, took pride in the partial sanitation of the Pontine area. The real extremes of severity were, however, best displayed in equatorial Africa, and it is no coincidence that Africa remained the dark continent because the barrier of disease—principally malaria—caused the isolation of all except its fringes from the rest of the world during all historical time. The distinction between equatorial Africa and other countries lies in certain characteristics of the prevalent anophelines which lead to an extreme frequency of transmission of the disease, to the extent that a newcomer may in some parts be exposed to daily or more frequent infection which he may not long survive. The African has suffered partly by direct effects, manifested principally in his children, amongst whom there is always a high mortality, and partly by the isolation which has sealed him off from most of the advances in mode of life which have at one time or another benefited other peoples.

If the utmost severity occurs in Africa, it is in Asia that the largest number of people are exposed to the disease, and where in consequence it causes the greatest volume of suffering. Russell<sup>1</sup> (1956) authoritatively estimates that 63 per cent of all of those people who are exposed throughout the world live in Asia: of them 300 million live in India, and 332 million elsewhere in the south-eastern portion. Nor can the intensity here be reckoned as mild, though in a few places

only does it approach that of Africa. In many parts there is a constant repetition of infection, of such severity that this one disease alone causes about a third of all deaths; and there are notorious centres of severe epidemics in northern India, Ceylon, and elsewhere.

There are records of attempts to avoid or control the disease by one means or another in the history of all these countries. In recent times the use of cinchona bark as a prophylactic was advised by the true father of tropical medicine, Lind, the man who stimulated Captain Cook to prevent scurvy on his ships by the regular drinking of lime juice, and quinine was in use as a prophylactic on the West Coast of Africa early last century. The great Koch advocated general medication to control the disease, and under his influence it became the principal mechanism in East Africa and the Mediterranean countries, to be later abandoned as a failure, but to be taken up again several times with equal failure on the discovery of new drugs. Control of mosquito breeding was advocated and practised soon after discovery of the rôle of the mosquito, and claimed many brilliant successes. Indeed in one sense it amounted to the conquest of malaria. For the first time it became possible to prevent the disease, or reduce it to a fraction of its previous level in almost any place, provided a sufficiency of skill, effort and money could be brought to bear on it. So the safeguarding of the Suez Canal, the salvation of the Malayan rubber industry and the building of the Panama Canal proved to be the forerunners of many successful schemes in which a combination of mosquito control and drug therapy were successfully used to sanitize towns, facilitate public works, and develop industries in the most insalubrious places. All of these successes had a common characteristic, however: they depended on an intense concentration of skill, effort and money in a limited locality, and on a scale which it would not be possible to deploy for the benefit of sparse rural populations.

The next big step was the transfer of the attack against the mosquito from the immature stages in the breeding place to the adult in the house. It was first made possible by the standardization of pyrethrum extracts in about 1930, and practised by two separate workers independently in South Africa. The new method produced unexpectedly brilliant results. The fact that the development of the parasite in the mosquito takes a couple of weeks or so made attack on the adult mosquito infinitely more profitable than attack on the larva, because it is much easier to prevent mosquitoes living for two or more weeks than it is to kill them all before or immediately after hatching. But even this great advance was out-dated by the discovery of new insecticides. DDT was the prototype, though it has now been followed by several others, notably gamma benzene hexachloride and dieldrin. The new method, using the new insecticides, displayed a potency in the control of malaria which was literally beyond the wildest dreams of previous workers. The coastlands of British Guiana had been notorious for the constant severity of malaria, which it was impracticable to control by other means, and which caused such mortality that the population was only maintained by constant immigration. Trials were made there in 1945, executive work was started soon after, and by 1947 the disease had not only decreased but absolutely disappeared.

The coastlands have by now been free from malaria for ten years, and have, incidentally, a rapidly growing population. Results such as this were inevitably sought elsewhere, and one country after another started the process, which besides being more efficient did not demand the intense local concentration of skill and money that previous methods required.

Repetition of success, and realization that the method was applicable to rural as well as to urban communities, led to further expansion actively fostered by national and international organizations. The scale of work changes so fast that it is hard to follow, and an analysis only a year old by Russell<sup>2</sup> is by now an underestimate. In the Americas, north, central and south, the majority of those exposed to risk are by now protected. The position is the same in the Mediterranean lands; malaria has disappeared entirely from its classical homes, where so much of the early description and continuous study has been carried out; Italy, Crete, Cyprus, Sicily, Sardinia have seen the last of it, in Yugoslavia, Turkey and the Levant it is on the way out and elsewhere diminishing. But though it is in these lands that the high proportion of the people have been protected, it is in the east that the majority of the people at risk live, and it is there that the biggest schemes protecting the greatest numbers are in progress. The programme for India now envisages the protection of 240 million people, and however simple the technique used there are enormous administrative problems in its development on this scale; problems of staff, training, organization, and problems of manufacture to supply the chemicals and apparatus. Up to the present it has brought protection to about 120 millions and so constitutes the world's biggest single scheme, though it has not yet protected all, or a large majority, of those at risk. Equivalent success to that achieved in the west has been reached in smaller countries: Ceylon has long had virtually complete protection for all its 3 million people at risk, the Philippine Islands are now gaining it for most of their 6 million at risk, Burma has an advanced mechanism, and most of the countries of south and east Asia have orderly programmes which are rapidly developing. Together they amount to the protection of about 170 million people, but even this enormous figure is still less than a third of all those exposed.

In equatorial Africa progress has been much slower, and only some 7 or 80 of the 82 millions exposed are now protected. Essentially the reason lies in the very severity of transmission, because it led to initial failures in the use of the new technique which set the continent back for five years while the reasons were studied. Now the reasons have been exposed, but even so, the fact remains that the economically poorest continent, with the least developed systems of administration and communication, will find control more expensive and demanding a better administrative background and better communications than do other countries.

Taking all these countries together, about one-third of the people who require protection are receiving it, and programmes are afoot for many of the remainder—in itself a magnificent record for the ten short years since the first general move in this direction. From that beginning two questions have been foremost in

many minds. Will progress continue in this way or receive some serious setback? And, will this protection, involving repeated interference in the house and quite heavy costs, have to be continued perpetually? An inkling of an answer first came to the latter question, in the island of Crete. Control was established in 1945, and by 1948 malaria seemed to have disappeared. A very watchful and cautious policy of discontinuation of spraying was practised, and now no spraying has been practised there for nine years. Despite this, and although a very strict watch has been kept, no recrudescence of the disease has been discovered and there is no doubt that malaria has been literally eradicated. The mosquitoes have not gone, the climate and the terrain remain unchanged, but the last case of the disease has disappeared, so that there is no source from which it can arise again. Such a total result was at the time literally beyond anyone's most extreme hope, but it has been repeated elsewhere and we now accept it as a realizable goal. Looking back on things, we were, perhaps, over-timid in not looking on it as a goal from the first. It is not an odd concept that a disease can disappear entirely, and many past examples of this were either unaided or only feebly aided by deliberate action. Cholera and typhus have entirely disappeared from this country within the last century. So too has malaria from most of Europe and North America; and further back in history there are many records of disappearance of disease, some still known, such as plague, while others such as the sweating sickness, which ravaged London in the fifteenth and sixteenth centuries, have gone so completely that we no longer know them as entities. When provided with a powerful tool such as our present insecticides we need not underestimate our abilities.

The possibility of a serious setback was demonstrated rather later. It was in the form of the appearance of resistance by the anopheline to the insecticide, first manifest in Greece, but later appearing in the Lebanon, Saudi Arabia, the U.S.A. and Indonesia, then in Nigeria and other places. Resistance was already an acknowledged phenomenon; there were old examples, and the domestic housefly had quickly developed resistance to the new insecticides in many parts of the world, to the extent that they quickly became ineffective in its control. Nevertheless, appearance in anophelines was a shock, perhaps made worse because it was delayed and hopes of its non-appearance had risen. We have known of it now for about five years, but with factual measurement for only three years and systematic laboratory study of it for less than two years. In consequence there was a relatively lengthy period during which it was known that the eradication of malaria was possible, when it was known that a threat to it in the form of resistance existed, and no effective means of countering that threat could even be formulated.

The natural result was pressure for rapid movement towards eradication before the threat became generally operative, to be practised as widely and largely as possible. It was adopted as a general aim at the World Health Assembly in 1955, and since then with only minor reservations by most of the Regions of the World Health Organization. Eradication had already been secured in a few places, either unintentionally or by very tentative techniques, and the



deliberate procedures had still to be defined. While still experimental, the general form now adopted will probably remain. Deliberate eradication involves four stages: planning, attack, surveillance and maintenance. The objects of planning are to secure that work will be ubiquitous in the area concerned, of high quality, simultaneous in all parts, and carried out without interruption which might permit recrudescence. The process of attack involves the spraying of all houses within the affected areas one, two or three times a year for three or four years, with the greatest care taken to ensure continuity and efficiency. During this prolonged period of cover, transmission should be completely prevented and the vast majority of residual cases in the community should recover completely from infection, so that at the end the reservoir of cases should be either exhausted or virtually so. The process of surveillance, lasting three or more years, is intended to ensure that this has in fact happened, and it includes lengthy and systematic search for cases, with treatment of any found, enquiry into their origins and the taking of any remedial action thereby indicated. With this the process should end—malaria should have been eradicated; but a country will long remain at potential risk, because fresh cases might be introduced and start the cycle again, so that maintenance involves a permanent vigilance mechanism.

One by one the countries of the world are accepting eradication as their object. Up to the present, 63 countries with a population of 680 millions exposed to the disease have declared that this is their policy. All the countries of the Americas, with 140 millions at risk, have embarked on, and are at one stage or another in, such programmes. So have all the Balkan, north Mediterranean and Levantine countries, from Corsica to Iran, to protect their 51 millions at risk. In Asia the principle is well recognized: Ceylon, Taiwan, the Philippines, Thailand and Afghanistan have set the pace which will almost certainly be followed by Burma, Cambodia, Laos and Vietnam, and these countries will account between them for 42 millions at risk. The big question is of course India, and there the very magnitude of the problem, 300 millions at risk, must inevitably cause delay in final decision. The administrative problems of control alone for such a vast number are stupendous, but they are being resolutely faced and when they are solved it seems probable that eradication will be accepted as a goal. This leaves only Oceania and Africa. In the former the numbers at risk are relatively minute, 1.7 millions, of whom 1.4 millions live in Papua or New Guinea, which countries have not yet reached a stage of development sufficient to make an ambitious programme possible. In Africa affairs are still in an early stage. Many countries of the north and south have a creditable record of control, amongst them Morocco, Algeria, Egypt, Sudan, Mauritius, Madagascar, the Rhodesias and lands south of them. In Central Africa, too, control has made a good start, notably in French Equatorial and French West Africa, the Belgian Congo, North Nigeria and Angola, but eradication is still in the distance, by reason of poor communications and administrative background and special problems of intensity and cost.

Alongside this impressive picture of movement towards eradication one may



look at the intensity of work devoted to unravelling the nature of anopheline resistance to insecticides, the fear of which was largely responsible for its stimulation. There is a considerable amount of work in progress on the subject of insect resistance as a whole, much of it being concerned with either the house-fly or that useful laboratory insect, *Drosophila* (both of which are used as representatives of the insect world), and much of the rest with insects of agricultural interest. Some of the knowledge so gained can be applied to the anopheline, but not all of it. In particular, the important subject of inheritance and population dynamics (which involves dealing with the way in which resistance in a population is built up and may later either decrease or increase), can only be studied on the type of insect concerned—the anopheline. But the places where such work is going on are very few indeed. Recent careful surveys indicate that anopheline resistance engages the whole-time attention of about a dozen scientific workers throughout the world, and the part-time attention of another three or four dozen. I can find on record less than thirty scientific papers describing a truly experimental approach to this subject in the anopheline, and another forty dealing with factual measurement of anopheline susceptibility or resistance. Though the numbers of workers or papers cannot always be taken to represent the volume or intensity of work, I think that in this particular case they are indicative.

This scale is not in proper proportion to the importance of the subject, or to the vast extension of executive work which the appearance of resistance stimulated. The disproportion illustrates a weakness in the present great expansion of public health programmes throughout the world—it has not been accompanied by a similar expansion of research. Fundamental research is safe in the mechanisms which have supported it in the past, but there is a need for a great deal of applied research into problems of topical interest, which the world as a whole has not yet learnt to provide.

To return from this digression to the results of these campaigns: almost universally where they have been carried out, death rates have markedly decreased. Ceylon enjoys the services of a very efficient Registrar-General's Department and its figures may be taken as representative of general happenings. The crude death rates from 1940 to 1946 averaged 20.4 per 1,000. Control was established in 1947; the rate immediately dropped to 14.3 and averaged 12.4 per 1,000 between 1947 and 1954. Obviously a great deal of suffering and distress has been prevented. Moreover a great deal has been gained in terms of reliability. A mode of life above the subsistence level demands regularity of attendance at work, and by making it possible for employers to rely on this, malaria control contributes greatly to economic development. Further, control has made many previously useless tracts of land available for development. One of the early applications of modern control was to the Terai land of northern India, which had lain uncultivated through centuries owing to insalubrity, but which has since been colonized by millions who now live on it in health. Ceylon has resettled over a tenth of its population on previously vacant land since malaria on it was controlled. I have just returned from the Philippine Islands, in which one of the remarkable features is the rapid migration of people into enormous tracts of

country which were almost empty until very recently. By these and similar mechanisms very material good has already ensued.

There is, however, another side to the picture—the growth of population. This is often interpreted in terms of impending disaster, though I prefer to look on it as a challenge to effort. There is no doubt that the rate of population growth has been accelerated, and largely as a result of malaria control. The scale of this increase may again be illustrated by figures from Ceylon, though that country is not alone in this respect. The average annual natural increase between 1940 and 1946 was 1.7 per cent. In 1947 it abruptly increased to 2.5 per cent, and up to 1954 averaged 2.7 per cent per year. Projection of this into the distant future is too full of pitfalls to be safe; the human race has adapted itself in the past and we must both encourage and help it to adapt itself to this access of well-being. There are, however, early effects which no adaptation can avoid. Taking the tropical world as a whole, the acceleration in growth is rural, and it is very unlikely that the rural environment can provide occupation for the rapidly increasing numbers, even should it provide food. A search for industrial employment is inevitable and must precipitate an extremely rapid growth of towns. There are dangers to the towns themselves in this, such as we experienced when ours grew fast during the nineteenth century. The severance of rural ties means the development of new social and cultural patterns which may be very different from the old and may be greatly influenced by early experience in the towns. Most important amongst these effects is that the satisfaction of the needs of expanding populations demands capital investment in industry, land development, and housing on a scale unprecedented in tropical countries. Whilst improved health gives them one of the necessities of development, it also gives them a challenge to undertake that development. The full extent to which they can meet it, or can be helped to meet it, remains to be seen, but there is no doubt in my mind that the repercussions of malaria control and population growth will be felt around the world in an infinite variety of ways. It will be the business of the next half century to ensure that advantage is taken of what is potentially good in them, and that the world is seen through a difficult period of readjustment to new conceptions of health.

#### REFERENCES

1. Russell, P. F. (1956): *Amer. J. Trop. Med. Hyg.*, **5**, 937-65.
2. *Ibid.*

#### DISCUSSION

THE CHAIRMAN: Professor Macdonald has given us a very balanced description of the present situation in malaria control. It seems to me that he has raised a number of issues which go far beyond the technicalities of malaria prevention, and it may be that some of those present have been stimulated to ask him questions.

SIR SELWYN SELWYN-CLARKE: We have all greatly enjoyed Professor Macdonald's informative and beautifully composed address. I should like to ask three questions. First, I wonder if Professor Macdonald would tell us whether pyrethrum, of which about £2m. worth is exported from Kenya every year, could in fact be utilized to

take the place of the D.D.T. and other anti-mosquito sprays to which anophelines have developed a resistance? Secondly, Professor Macdonald mentioned the need for more co-ordinated research: would he tell us whether he has in mind something similar to that international organization for the attempted control of locusts which has achieved such good results? Does he think that a body working either through the World Health Organization or some other international organization could meet the need that he has mentioned? My third question is prompted by Professor Macdonald's reference to partial immunity which populations living in malarious areas develop as they grew in stature. I was once present at a Conference where a distinguished lady observed that she thought it was wrong for us to maintain infant welfare centres in the tropics where we gave anti-malarial drugs for the cure of small children. Her reasons were that if children were left untreated they would grow up with a degree of resistance to the disease, whereas anti-malarial drugs tended to destroy the possibility of that resistance developing. She did not explain that millions of small children would die of the disease, particularly of cerebral malaria, unless they did receive treatment. Would Professor Macdonald care to comment on the question of immunity in that context?

THE LECTURER: On the question of the possible replacement of D.D.T. and other insecticides by pyrethrum, I am afraid I must be disappointing. I think it is very unlikely that the replacement could be made. These two groups of insecticides have parallel but dissimilar properties. I think that there will continue to be a demand for both but that neither can take the place of the other. On the question of research, I believe we should seriously review the research mechanisms; in particular, we should use the means possessed by these international organizations which were not originally instituted to undertake research—though their terms of reference have been slightly modified to permit them to do so. I think that we should review their functions and authorize them to undertake, promote and finance research on a scale comparable to that of the executive work which they undertake. The immunity question is one of which Sir Selwyn Selwyn-Clarke has been aware for a long time and he knows that I have joined in it too. In the days when it was not possible to achieve the general control of the disease one had to consider, when an infant came to the clinic, that he was shortly going to leave that particular set of circumstances and go into places where he would meet malaria on a widespread scale, and that he might thereby be exposed to risks through not having developed an immunity. I think the present position however is that we can foresee the protection of very large areas, so that now we have got to consider that the child will probably not be visiting areas where he might be infected. In losing or not achieving his immunity, the child has not had to pay the price of immunity; but if these large areas are, in fact, protected he will be under no form of disadvantage through not having gained it. In short, I think that the enhanced scale of control has finally settled the immunity question, which was a very lively one not very long ago.

THE CHAIRMAN: Professor Macdonald has shown that there is reason to suppose that malaria can be wiped out from enormous areas of the world, and that it can be so eradicated that it ceases to be a known disease—just as it is at present in this country. But we have still a long way to go before that is finally accomplished, and I think it is essential that we do not rest on our laurels, and suppose that all the remaining work can be done by mosquito squads or big organizations. There remains a vast amount to be known about malaria in such countries as Africa or India, for example. In different places the disease has its own characters, and something more than statistics are needed to advance research into these. The resources of big organizations are needed, but also a great many laboratories where experts can work on the subject. And all those engaged in this work will want great encouragement from those of us

who are not actually engaged in it. Let us now, in thanking Professor Macdonald for his excellent lecture, make that plain.

*The vote of thanks to the Lecturer was carried with acclamation.*

SIR SELWYN SELWYN-CLARKE: You may not know that our Chairman made a journey in the fog all the way up from Cambridge to preside at our meeting this afternoon. If I may suggest it, that is an indication of his spirit.

Colonel Sir Rickard Christophers began his study of malaria as long ago as 1898, and for many years held a very important post in the Indian Medical Service. His own studies have resulted in a great deal of practical application to the eradication of malaria, and he has, as we all know, an international reputation as a malariologist. We could not have been favoured with a more distinguished chairman for this lecture. On behalf of all those present may I thank you warmly, Sir Rickard.

*The vote of thanks to the Chairman was carried with acclamation.*

May I, Mr. Chairman, say one more thing in conclusion? We have with us this evening, for the last time I am sorry to say, Miss Mary Macgillivray, the representative of the High Commissioner for Canada. Miss Macgillivray has been a valued supporter of the Commonwealth Section of this Society and we shall miss her very greatly when she returns to Canada. I would ask you all to join with me in wishing her God speed.

*The vote of good wishes to Miss Macgillivray was carried with acclamation, and the meeting then ended.*

# SOME NUTRITIONAL ASPECTS OF VITAMIN B<sub>12</sub>

*A paper by*

*FRANK WOKES, B.Sc., Ph.D., F.R.I.C.,*

*Director of Research, Ovaltine Research Laboratories,  
read to the Society on Wednesday, 4th December,  
1957, with Sir Allen Daley, M.D., F.R.C.P., Chair-  
man, United Kingdom Committee for the World  
Health Organization, in the Chair*

THE CHAIRMAN: We welcome Dr. Wokes here to-day as a distinguished scientist, particularly in view of the world-wide importance of nutrition. In that respect I should like to thank this Society for the interest it takes in the World Health Organization, which is deeply concerned, together with the Food and Agricultural Organization of the United Nations, in improving the nutrition of the peoples of the world. The Royal Society of Arts was one of the first to become a sponsoring member of the United Kingdom Committee for the World Health Organization.

Dr. Wokes's work is primarily for a private firm, working in collaboration with other laboratories. Some people think that all research should be sponsored by government: I do not agree, because I know of the enormously valuable research work, particularly on pharmaceutical matters, which has been done in private laboratories. Dr. Wokes has been engaged on fundamental researches into the nature of vitamins, particularly B<sub>12</sub>, and I have seen and read a list of the publications on this subject which comes from his laboratory.

*The following paper, which was illustrated with lantern slides, was then read:*

## THE PAPER

When honoured by Council's invitation to give this lecture, my thoughts turned to the late Sir Jack Drummond, whose earlier lectures on vitamins aroused so much interest and delight amongst our members. Before the tragic murder of Sir Jack with his family, which shocked the civilized world, I had on various occasions discussed vitamin problems with him, and if he had been alive now I would naturally have asked his advice on how to deal with my topic. However, his great interest in the use of vitamins in human nutrition, which in collaboration with Lord Woolton found effective nation-wide application in the brilliantly successful food policy in the Second World War, leads me to think that he would have approved my choice of subject. The scientist has to look at vitamins from many points of view. One of the most important of these is surely the use of vitamins to make good deficiencies in diets, especially when there seems to be a possibility of extending the scale of such applications of vitamins to cope with world food problems. My lecture will attempt to describe some of the scientific problems involved in such an ambitious project, and will concentrate on vitamin B<sub>12</sub>, the most recently discovered, and in some ways the most interesting of the vitamins.

My qualifications for attempting this difficult task are, I fear, not very imposing when compared with those of the many giants in this field who have been intensively investigating during the last few years numerous aspects of vitamin B<sub>12</sub>. Nevertheless, the possible use of vitamin B<sub>12</sub> in human nutrition has so far received comparatively little attention from scientists, most of whom consider it only as a cure for pernicious anaemia due to lack of the intrinsic factor needed for absorption of the vitamin from the intestine.

Thus in the report of the First European Symposium on vitamin B<sub>12</sub> held in Hamburg in 1956 and attended by leading workers from all parts of the world, only about 1 per cent of the total space is devoted to possible applications of the vitamin in human nutrition.<sup>1</sup> Despite the occurrence of dietary deficiency of B<sub>12</sub> in animals of various species, no one seems to have known anything about such dietary deficiency in man until it was described to the Third International Congress of Nutrition in 1954 by myself and my colleagues Drs. Badenoch and Sinclair of Oxford.<sup>2</sup> But I must first explain how my interest was initially aroused in this problem.

During the Second World War, when the Allied troops in Italy were preparing to advance and capture Rome and Northern Italy, it was anticipated that after the break-through a temporary shortage of cows' milk might be encountered in some of the liberated areas. To meet the emergency needs of infants and children there was devised by B. Ward Perkins of the British Red Cross, and Caprino, an Italian brewing chemist, a milk substitute made mainly from oats, the staple local cereal, which had been malted, leading to the name Maltavena (from *Avena sativa*), the botanical name for oats being applied to the product. Soya when available was added to increase the protein content, also calcium to the same level as in milk. As the term Maltavena was later registered and hence not available for general use, the foods are now termed malt and soya, which is often abbreviated to MS.

Meanwhile the idea of these MS foods was passed on to U.N.R.R.A. in England, and our laboratories were asked to help. We prepared a series of small-scale batches of experimental foods from different proportions of malted cereals (barley and wheat) and soya, and these were tested on normal weanling rats by Dr. Harriette Chick and her colleague Dr. Slack.<sup>3</sup> Under their experimental conditions it appeared that growth almost identical with that produced by cows' milk could be obtained from a suitable malt and soya food. Later results showed the problem to be, in fact, much more complex than was indicated by this apparently clear cut result. At the time this was not realized, and the way seemed clear for clinical trials.

The Medical Research Council thereupon instituted a series of feeding trials of MS foods on German infants and children in the Ruhr, to which we contributed a ton of experimental food, further batches being made to various formulæ in Germany. The results of these trials, in which we are glad to have helped, are described in detail in the monograph on Plant Proteins in Child Feeding by Dr. R. F. A. Dean.<sup>4</sup> They indicated that moderately satisfactory growth could be obtained in infants and children receiving the malt and soya



foods in place of cows' milk and as main source of protein. But still better growth was obtained when about a fifth of the protein in the malt and soya foods was replaced by milk protein. The experimental periods during which the foods were administered ranged from one to four months.

During the course of these German investigations two important new factors came to light. The first was the existence in the soya bean, and in certain other staple pulses, of a trypsin inhibitor which could interfere with the digestion of protein in persons consuming the beans. Methods were worked out for destroying this inhibitor (e.g., by action of germination enzymes or by controlled heating) during manufacture of the malt and soya foods. If heating were employed, great care had to be taken to avoid denaturing the soya protein and thus diminishing its nutritive value.

The second new factor was the possible effect of vitamin B<sub>12</sub> in improving the biological value of vegetable proteins. This effect had been established in America for several species (chick, rat, pig), but not yet for man. Dr. Dean did not become aware of this possibility until nearly the end of his German investigation, when it was too late to organize satisfactory experiments with vitamin B<sub>12</sub> on infants or children. However, he was able to show that injection of vitamin B<sub>12</sub> improved the growth of weanling rats living on the malt and soya foods.

Whilst these investigations were being carried out in Germany we studied in our laboratories methods of improving the palatability and nutritive value of the malt and soya foods. By kindness of Dr. Cyril Pink, these improved MS foods were tested on a series of babies suffering from various allergies to animal foods which were fairly common amongst the babies of the vegetarian mothers who formed a large part of his clinic at his Blackheath Nursing Home. The MS foods cleared up the allergies satisfactorily, but did not produce growth quite equal to the standard based on the findings of leading British and American paediatricians. In view of Dr. Dean's finding that satisfactory growth could be obtained by replacing a fifth of the vegetable protein in the MS foods by milk protein, we introduced this modification in a new batch of the food which we termed MSM (malt, soya and milk). At the same time we prepared another new batch in which the modification was not made so that it contained only vegetable protein as before, but vitamin B<sub>12</sub> was added to a rather high level. This food was termed MST food (malt, soya and vitamin B<sub>12</sub>).

These MSM and MST foods were supplied as almost complete sources of the protein (apart from traces provided by fruit and vegetable juices) in the diets of babies as they became available at Blackheath. Because of the milk protein in MSM food, it was less effective than MST food (which contains no animal protein) in the treatment of the allergies. As far as growth promotion was concerned, however, no significant difference was observed between MSM and MST. Some of the babies were on the diets for too short a time (because of the rapid disappearance of their allergies) for mathematic evaluation of their growth responses to seem justifiable. The Table on page 116 summarizes results on a few babies who were on the foods for a sufficiently long time to permit such evaluation. These results were obtained in a prolonged investigation over a number of years

which was described to the Fourth International Congress of Nutrition in Paris this year.<sup>5</sup>

TABLE  
GROWTH OF BABIES ON VEGAN FOODS

				<i>Weeks on</i>		<i>Weight increase as % of standard increase</i>		
<i>Baby food</i>				<i>birth weight</i>	<i>breast</i>	<i>baby food</i>	<i>breast</i>	<i>baby food</i>
<i>MS/1</i>	<i>D.J.*</i>	..	..	2.87	26	17	73	44
<i>MS/2</i>	<i>D.F.</i>	..	..	2.82	41½	41½	90	53
	<i>C.</i>	..	..	2.87				76
	<i>H.N.†</i>	..	..	3.81	41	15	52	202
	<i>H.S.</i>	..	..	4.63	24	20	54	87
means							65	105
do excluding†							72	72
<i>MSM</i>	<i>S.T.</i>	..	..	3.35	32	21	69	109
	<i>A.B.</i>	..	..		32	15		101
means								105
<i>MST</i>	<i>A.W.</i>	}	twins	1.96	12	31	100	100
	<i>M.W.</i>			2.73	12	31	89	102
means							95	101
<i>Various on H.B.</i>								
<i>MSM</i>					29	10	—	30
<i>MSM and extra milk</i>					—	6	—	151
<i>MST</i>					—	12	—	211

Now, my colleagues and I do not for a moment pretend that the few results we have so far been able to obtain in this investigation prove that vitamin B<sub>12</sub> is of value in the nutrition of infants, though we do think that they point to the urgent need for collecting similar data, preferably by other workers who can thus check our findings. The problem is an extremely difficult one, as has been recognized by leading workers in the field of protein malnutrition. There have indeed been a number of attempts during the last few years to test the value of vitamin B<sub>12</sub> when added to the diet of supposedly normal American or European children, but these experiments all suffered from two serious disadvantages.

- The diets of the children, before or during the experiment, were not shown to be deficient in the vitamin.
- No evidence was provided that their natural stores of the vitamin, which may normally be sufficient for a year or two, had been seriously depleted when the experiment started.

In order to obtain conclusive results in clinical trials of the nutritive value of vitamin B<sub>12</sub> it seems necessary to have available persons who have been living for several years at least on a diet practically free from the vitamin, so that their body reserves have become exhausted. Since vitamin B<sub>12</sub> has so far been found in significant amounts only in animal foods a diet entirely free from animal

foods should be practically free from the vitamin. Consumption of such a diet for prolonged periods must usually be very rare in this country—though not in some other countries and peoples—the Jains in India, for example. Amongst the many thousands of vegetarians in this country there have probably always been one or two here and there who eschewed not only flesh foods but also dairy produce—milk, eggs and cheese. But only about ten years ago did these extreme vegetarians term themselves vegans and organize themselves into a society which soon had several hundred members. Quite unconsciously, as they continued to live year after year without any animal food (and therefore without any significant dietary intake of vitamin B<sub>12</sub>) they can (with certain exceptions to be considered later) be imagined as gradually depleting themselves of their natural reserves of the vitamin (e.g., in their livers) and gradually approaching the time when B<sub>12</sub> deficiencies could become apparent.

Being a life vegetarian myself, I had many friends (and indeed some relatives) amongst the vegans, and had watched the start of their experiment with considerable interest. I made a careful study of their diet, on which I lived for a week whilst walking in the Lake District, and did not think it seemed likely to be seriously deficient in any known vitamin, provided that the vegetarian margarine or nut butters used in place of dairy butter had been fortified with calciferol or vitamin D<sub>2</sub>, a purely vegetarian product. At that time, of course, vitamin B<sub>12</sub> had not yet come into the picture.

Linked up with the vitamin B<sub>12</sub> intake is the protein content, which in some of the vegans tended to be on the low side.<sup>6</sup> In some vegan women (teachers and housewives, for example) their dietary protein provided only 8.7 to 10.1 per cent of their total dietary calories, as compared with an average of about 12 per cent in normal British post-war diets. The balance was partially restored, however, by a vegan police inspector whose protein intake was about 17 on the same scale. In the average adult vegan the protein intake is probably sufficiently high to cope with requirements, but this may not be true for some vegan children.

The protein in vegan diets is, of course, all vegetable in origin. Animal proteins, especially those in dairy produce, have been generally considered to have a rather higher biological value than vegetable proteins, but some doubt has been thrown on this conclusion by the excellent results which have been obtained recently with certain mixtures of vegetable proteins. The value of such mixtures depends on the proportions of different essential amino acids present. Cereal proteins tend to be deficient in the essential amino acid lysine, but some cereal proteins (e.g., those in maize) are as rich in the essential amino acid methionine as almost any animal protein. The proteins of pulses (e.g., soya) tend to be deficient in methionine, but contain a fair amount of lysine. Thus a suitable mixture of cereals and pulses can be devised which will provide adequate amounts of both these essential amino acids.

It has recently been suggested that vegans should improve their intake of protein by consuming more leaf protein.<sup>7</sup> As far as green vegetables are concerned the average vegan, though eating more than usual amounts, obtains perhaps only

5 per cent of his total protein requirements from such a source. However, experiments are now in progress at Rothamsted to extract the protein from different kinds of leaves and use it as a supplement to protein deficient diets in underdeveloped countries. The results are awaited with much interest.

My observations on a number of the vegans during the first year or two they were on their diet containing no animal foods, indicated that they were maintaining their normal health and vigour and laughing at my warnings. After a few years, however, reports began to reach me of illnesses, apparently associated with the central nervous system, which some, though by no means all, of the vegans were encountering. These illnesses could be cured with cows' milk, but the vegans, even when seriously ill, could not always be persuaded to take this. Some of their medical practitioners considered them to be suffering from pernicious anæmia and prescribed injections of vitamin B<sub>12</sub>, which gradually cleared up the signs of deficiency. But as these signs could also be cleared up by oral administration of vitamin B<sub>12</sub> there was no lack of intrinsic factor, and the blood picture also showed no signs of pernicious anæmia. A comprehensive study of the vegans which I carried out in collaboration with Drs. Badenoch and Sinclair showed some of these vegans to be suffering from a dietary deficiency of vitamin B<sub>12</sub>, characterized by low serum B<sub>12</sub> values (though not as low as in pernicious anæmia), glossitis with very sore tongues, paræsthesia and in advanced cases effects on the central nervous system producing rigid 'Vegan' backs; and in one or two instances subacute combined degeneration of the cord.<sup>2</sup> Amongst female vegans menstrual disturbances were fairly frequent. All of these could be gradually cured by administration of vitamin B<sub>12</sub>, which sometimes had to be prolonged for many months.

You will note my reference to only 'some' of the vegans exhibiting these deficiencies. Quite a number, indeed, seemed to escape any serious illness, whilst others who encountered these deficiencies succeeded in overcoming them without taking any vitamin B<sub>12</sub>. The interesting question arises—where did these 'successful' vegans obtain their vitamin B<sub>12</sub> from? They may, of course, have started with larger body reserves of the vitamin, but at the very best such reserves could not be expected to last more than five years, and some vegans have remained on their diet for ten years or more without showing any definite sign of vitamin B<sub>12</sub> deficiency.

You may ask whether some of the items in the vegans' diet may not have contained enough vitamin B<sub>12</sub> to ward off development of deficiency. We have examined fresh samples of many of the staple foods eaten by vegans and cannot find in them significant amounts of the vitamin. The only notable vegetable source of vitamin B<sub>12</sub> we have so far encountered is the preparation of edible seaweed known as laver bread in South Wales and as dulce in Scotland. Two or three ounces of this might provide the daily requirement of the vitamin. It is interesting to note that such quantities may be consumed by Welsh miners who, because of their great loss of salt in perspiration, are glad to eat the salty seaweed preparation as a cheap substitute for liver and thus for generations have been unwittingly replenishing their stores of the vitamin from this rich marine

source. Vegans have not been found consuming these seaweed preparations, and hence did not get their vitamin B<sub>12</sub> from them.

Some people in other parts of the world who are compelled by economic reasons to live on diets containing little or no animal food may be obtaining significant amounts of vitamin B<sub>12</sub> from germinated and/or fermented foods. Our experiments on different cereals and pulses have shown that, whilst germination can produce considerable increases in the contents of various B vitamins, raising their dietary intake above the critical level, this does not seem to apply to vitamin B<sub>12</sub>. The biggest increase we have been able to obtain was in peas, and even then it would be necessary for an adult person to eat something like a kilogram of the germinated product daily to satisfy his vitamin B<sub>12</sub> requirement. However, in the Far East, for example, where germinated and fermented foods are much more widely consumed, they may perhaps provide significant amounts of the vitamin.

Even though the vegans' diet in this country (and also in Holland and the U.S.A., where vegans are also being studied) contained no significant amount of vitamin B<sub>12</sub>, they might still be obtaining this vitamin from their intestinal flora, which contains micro-organisms known to be capable of synthesizing the vitamin. In the ruminant animals certain micro-organisms in the rumen and intestine can supply the whole of the vitamin B<sub>12</sub> requirement. The cow, for example, obtains in this way not only all the vitamin B<sub>12</sub> she needs for herself, but also a good deal more which she puts into her milk. Non-ruminant animals, including man, apparently usually get only a small fraction of their daily requirement of the vitamin from their intestinal flora, but there is evidence that they *are* getting some from this source because, when sulpha-drugs are administered orally, the resulting changes in their intestinal flora can lead to vitamin B<sub>12</sub> deficiency. If normal human beings can obtain some vitamin B<sub>12</sub> in this way, it is possible that vegans may obtain more. This might happen, for example, by modification of their intestinal flora so that more of the vitamin became available to the vegan host.

It would be a fascinating study to follow the vitamin B<sub>12</sub> content of vegan breast milk throughout lactation. There is reason to suppose that this milk does contain a reasonable amount of vitamin B<sub>12</sub>, because of the excellent progress of the vegan babies receiving the milk. If a vegan mother, starting with little if any vitamin B<sub>12</sub> stored in her tissues, and receiving none in her diet, has yet been able to provide her baby with sufficient of the vitamin throughout a prolonged lactation, there is a strong presumption that the vitamin must have been made by the mother's intestinal flora.

The question of the human intestinal flora as a possible source of vitamin B<sub>12</sub>, and its modification by various factors, is obviously of great importance. I have discussed it at length with my scientific friends, especially Dr. Lester Smith, the discoverer of vitamin B<sub>12</sub> in this country, who takes a personal interest in the vegan problem.<sup>8</sup> We feel that it can be settled conclusively only by experiments on man. If human volunteers were given orally radioactive cobalt, and this were subsequently detected in vitamin B<sub>12</sub> in their tissues and urine, this would not



only prove that they had absorbed from their intestines some vitamin B<sub>12</sub> which had been synthesised by the micro-organisms there, but would also furnish a means of roughly estimating the rate of production of the vitamin. On paper it is possible to plan such an experiment using a short life isotope which would involve no risks to the volunteers. In practice there are great difficulties to overcome before such an experiment can be expected to yield useful results. Hence up to the present we are not certain what is the source of vitamin B<sub>12</sub> to which many of the vegans appear to owe their success in maintaining themselves for long periods of years on the diet.

Now, in all our investigations on the vegans the idea has been implicit that vitamin B<sub>12</sub> can improve the biological value of vegetable proteins for man, as it has already been shown to do for various species of animals. This effect, if actually present, must be capable of being linked up eventually with some active grouping in the vitamin B<sub>12</sub> molecule. You may ask what progress has so far been made in tackling this difficult task.

In the first place, one of the striking differences between staple animal proteins (e.g., casein) and staple vegetable proteins (e.g., those in wheat or soya) has been found to lie in a deficiency of the vegetable proteins in the essential amino-acid methionine which contains sulphur. In certain micro-organisms methionine has recently been shown to be produced from sulphur-free amino acids by metabolic pathways too complicated to discuss here but necessarily involving a biological carrier of sulphur which can be set free at the required time and place to take part in the synthesis of methionine.

Let us look at this beautiful model of the vitamin B<sub>12</sub> molecule kindly lent me by Dr. Lester Smith. Close examination of the model shows the cobalt atom round which the whole molecule is built up. To one side of the cobalt atom there is attached a cyanide (-CN) radicle, and to the opposite side there is attached a chemical bond which can fairly easily be broken. This breaking of the bond opens up a point of attachment for another cyanide radicle, and allows a large section of the molecule to hang loose so that it may serve as a kind of template for the synthesis of amino-acids from which proteins are built up. The cyanide radicles attached to the cobalt atom can under certain conditions be replaced by hydroxyl (-OH) ions, and these in turn can be displaced by thiocyanate (-SCN) ions.

Now, cyanide is poisonous to us as to other animals, and we all therefore have in our bodies a means of detoxicating a certain amount of cyanide to thiocyanate through the liver enzyme rhodanese. But although most of the cyanide is thus put out of action a minute amount is always present in the blood, which indeed contains an enzyme which can convert thiocyanate to cyanide and thus maintain the blood cyanide level. The rather astounding idea is thus emerging that cyanide is an essential metabolite, and since the cyanide is carried by vitamin B<sub>12</sub>, this vitamin is closely related to the cyanide-thiocyanate metabolism. The excretion of thiocyanate in the urine, which under certain conditions can be used to study this metabolism, has been found to be lowered in vegans deficient in vitamin B<sub>12</sub>, and increased by administration of the vitamin.<sup>9</sup> On the basis of these and other



findings obtained on a number of volunteers, including myself and some of my colleagues, a theory has been put forward attempting to explain the rôle of vitamin B<sub>12</sub> in the improvement of vegetable proteins by helping to form more of the sulphur-containing essential amino-acid methionine in which these vegetable proteins are deficient.<sup>10</sup>

Dr. Sorbo at the Nobel Medical Institute in Stockholm has recently carried out some interesting experiments which have a bearing on our theory, and we look forward with much interest to a detailed interpretation of his results.<sup>11</sup>

Time does not permit reference to a number of other interesting recent developments in the vegan story. We must turn next to the wider implications of our findings. One of the major world food problems is the lack of satisfactory protein in underdeveloped areas. The staple diets of about two-thirds of the world's population contain very little animal protein, and the mixtures of vegetable proteins in use are often unsatisfactory both in quality and in quantity. This has led to various protein deficiencies, amongst which *Kwashiorkor* has recently been receiving much attention. In the past *Kwashiorkor* has been cured by administration of cows' milk. But this would not be available in anything like sufficient quantities to provide all the infants in these underdeveloped areas with sufficient animal protein after they have finished taking breast milk. Therefore it was of much interest when Dr. Dean, who after completing his work on plant proteins in child feeding for the Medical Research Council in Germany went out to another M.R.C. unit in Uganda to study *Kwashiorkor*, found this protein deficiency disease could be successfully treated by a suitable mixture of plant proteins, based on soya, maize and bananas.<sup>12</sup> He considers that vitamin B<sub>12</sub> may play an important part, but his results with the vitamin are not yet sufficient to establish its value conclusively. Other workers are also finding difficulty in obtaining clear-cut evidence as to the nutritional value of vitamin B<sub>12</sub>. For example, at the 1955 Princeton Conference on Human Protein Requirements sponsored jointly by F.A.O., W.H.O. and the Josiah Macy Jr. Foundation, and attended by 29 leading experts from all parts of the world, conflicting views were expressed on the value of vitamin B<sub>12</sub> as a dietary supplement which had given good results in some experiments but not in others, and methionine has been thought by some workers to be receiving too much attention.<sup>13</sup>

Whilst vegetable proteins can be deficient in other essential amino acids (e.g., lysine) there are various indications that a sulphur-containing amino acid (i.e., methionine) is involved, together with vitamin B<sub>12</sub>, in protein deficiency diseases. First, the disease *Kwashiorkor* is characterized by changes in the colour of the hair which appear to be associated with deficiency of sulphur-containing amino acids. Secondly, myopia in children, which has recently been found to be halted by giving large quantities of milk containing animal protein and vitamin B<sub>12</sub>, may possibly be associated with a deficiency of sulphur-containing amino acids in the lens of the eye.<sup>14</sup> Thirdly, Dubnoff's theory that vitamin B<sub>12</sub> is concerned with the reduction of -S-S- compounds to the -SH state, which has been supported by recent findings of a number of other workers.

Fourthly, there are our own findings on the increased excretion of thiocyanate, the sulphur detoxication product of cyanide, in vegans deficient in vitamin B<sub>12</sub>.<sup>15</sup> So far these are only slight hints, but when added together they do seem to suggest that more attention should be paid to the sulphur-containing amino acids when considering the role of vitamin B<sub>12</sub> in human nutrition.

If our studies on the vegans can provide clues which will help to overcome these difficulties, the way may be opened for the large-scale use of the vitamin for treating and preventing the occurrence of various protein deficiency diseases. Thus the findings on a few hundred vegans might in some slight degree help to solve the nutritional problems of hundreds of millions of people in Asia, Africa and other under-developed areas.

We now come to the practical problems of fortifying or enriching foods with vitamins. On the national scale fortification of margarine with vitamins A and D proved quite effective in the Second World War. Fortification of flour with vitamin B<sub>1</sub> was considered but not fully implemented. The organization whose research I have been directing during the last fifteen years was one of the first in this country to enrich a staple food, Ovaltine, with vitamin B<sub>1</sub> so as to raise to a standard minimum level the varying amounts of the vitamin derived from the raw materials—malt, milk, soya and eggs. Nearly ten years' experience has shown us how to mix efficiently a few ounces of the vitamin into a batch of several tons of food, obtaining a product in which the vitamin is more uniformly distributed, more consistent in content from batch to batch, and more stable than in the raw materials used. Gradually our experience has been extended to other food products and to other B vitamins, including B<sub>12</sub>.<sup>16</sup> The latter requires a good deal of care, since recent findings have shown that it can readily be destroyed in the processing of certain foods such as milk, and also may be rendered very unstable in the finished product if the latter also contains significant amounts of vitamin C.<sup>17 18</sup> In this connection it is interesting to note that the soya bean milk substitute 'saridele', which is being made for child-feeding under the auspices of F.A.O. and U.N.I.C.E.F. in Indonesia, is being enriched with vitamins B<sub>12</sub> and C, which may be unstable.<sup>19</sup>

In America also vitamin B<sub>12</sub> is already being added to milk foods, breakfast foods and bread, and further uses are under consideration. Studies are being made to discover the losses during processing and storage. Provided there is not a significant amount of vitamin C present, there does not seem to be much loss of B<sub>12</sub> during dry mixing or storage. However, any vitamin B<sub>12</sub> in liquid milk may undergo appreciable losses during evaporation or other drying or condensing processes.

Finally, a few words on the question of vitamin supplies. Are these sufficient to cope effectively with vitamin deficiencies on a national or even on a global scale? Vitamins A and D come first to mind, since they were introduced during the Second World War into the national output of margarine. The amount of vitamin A thus provided, either preformed from animal sources or as the pro-vitamin beta-carotene, supplied less than a tenth of the total requirement, much of which came from carrots and green vegetables. During the last few years the

manufacture of synthetic vitamin A has begun to reach appreciable amounts in this country, and even more on the Continent and in the U.S.A., and the time may eventually be reached when the total output will have a serious impact on global requirements.

Vitamin D is in a rather different category. First, the variety known as vitamin D<sub>2</sub> is made, not from a staple food of which only limited amounts are available, but from a constituent of yeast which can be manufactured in unlimited quantities. Secondly, because of its high potency, about 100 times that of vitamin A on a weight for weight basis, the amount now being added to margarine can provide the total requirement. Thirdly, vitamin D<sub>2</sub> is much less expensive than vitamin A, and if due care be taken it can be used quite efficiently for the fortification of foods. There has indeed been a tendency to put too much vitamin D into foods, and steps are now being taken to reduce the level of fortification.

Vitamin C is also relatively inexpensive to manufacture on the large scale. In this country the output of synthetic vitamin could provide between a tenth and a fifth of the total national human requirement. In the U.S.A., this proportion can be increased to about a half.

Turning to vitamin B<sub>1</sub>, there are rich natural sources such as liver, yeast, the germs of seeds and germinated products which should help in securing adequate intakes not only of vitamin B<sub>1</sub> but also of riboflavin, niacin and vitamin B<sub>6</sub>. The manufacture of synthetic vitamin B<sub>1</sub>, however, has developed rapidly during the last few years, and if the total output in this country were all available for human consumption, it could provide about a third of the total human requirement. In the U.S.A. the corresponding figure would be about two-thirds.

Lastly, we come to supplies of vitamin B<sub>12</sub>. These initially were as by-products in the manufacture of antibiotics, but the demand for vitamin B<sub>12</sub> has increased so greatly that the antibiotics have now become the by-products. Unlimited amounts of the vitamin are thus obtainable, and the present output could readily be expanded to meet any demand. Suppose, for example, that each person in India was to receive 50 per cent of his or her requirement of vitamin B<sub>12</sub> by adding it to staple foods. The total amount of vitamin needed annually would only be a few hundredweight, well within the capacity of present manufacturers. The cost per head of the population could probably be reduced by efficient manufacture to 2d. or 3d. a year, a small price to pay for the benefits which might ensue.

With this brief glimpse into future possibilities for the use of vitamins in improving human nutrition, we come to the end of our excursion into a fascinating field of human endeavour which, unlike some other scientific fields at present receiving so much attention, can yield only benefits to the human race.

I am indebted for help and advice to many colleagues, too numerous to mention individually here, but acknowledged in our various publications. My thanks are also due to Dr. A. Wander, S. A. Berne, Messrs. Roche Products Ltd., Welwyn Garden City, Herts., and Merck & Co. Inc., New Jersey, U.S.A., for details of the manufacture and use of vitamins in Europe and America; to Dr. Lester

Smith, F.R.S., for the loan of the vitamin B<sub>12</sub> model, and to all the vegan and non-vegan volunteers who co-operated in our investigations.

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## DISCUSSION

THE CHAIRMAN: Dr. Wokes has made a very complex subject extremely clear. It is, of course, a subject of vast importance and of great historical interest. I was reminded of the person who discovered vitamins, Hopkins, whose memory we all revere. An extremely modest man, hard-working, and highly intelligent, he was able to find the key which unlocked many of the nutritional problems which confronted this and other countries. We were particularly confronted with them during the last war, and I was interested when Dr. Wokes mentioned Sir Jack Drummond. About twenty years ago, Sir Jack came to see me at my office in County Hall. He had been sent by Mr. Herbert Morrison, then Leader of the London County Council, whom he had been telling about his visit to Scandinavia, and about what they call the 'Oslo breakfast', which they gave to needy children in Oslo and other Scandinavian countries; he suggested that we might think about it for London children. For various reasons we did not think it was desirable to have that type of breakfast here, but we did provide the same nutriment at other times of the day, particularly in the midday meal. Dr. Bertha Sharpe did quite a lot of experimental work on comparing the growth and well-being of children fed on this special 'Oslo lunch' as we called it, compared with those who had the ordinary, rather stodgy school meal which up to then had been provided.

I am reminded, too, of another person whom Dr. Wokes mentioned, Dame Harriette Chick, and the wonderful work she and her team did in Vienna when the children were starving after the First World War. My own department did some experimental work on supplementary feeding with B<sub>12</sub> at a children's orphanage, but we were not able to make a great deal out of it for the reason Dr. Wokes gave—that the children's ordinary diet up to then, and during the course of the supplementation, was devised with reasonable skill and care.

Dr. Wokes also mentioned *Kwashiorkor*. I do not know whether Dr. Cecily Williams, who discovered it, is here or not, but if ever you get the chance of seeing a coloured film produced under her auspices, of nutritional surveys in Central Africa, you certainly ought to do so. It is a wonderful film, and illustrates what our lecturer has told us of the serious effects of protein deficiencies in these countries with teeming populations fed on an inadequate diet. I should like to underline what has been said,

that two-thirds of the world's population do not have a really satisfactory diet and that at a cost of 2d. or 3d. a year per head, by supplementation of their diet with B<sub>12</sub>, a lot of dietetic problems would be solved. Another thing I should like to mention is experimental animals. Animals have been used for experiment in dietetic studies from time immemorial, and some people are always a little sceptical whether the results of feeding rats and mice can be used for helping us in the problems of human dietetics. Perhaps Dr. Wokes will say something on that in due course. But now we have the vegans who of their own free will have adopted a certain form of diet. They are a form of human guinea-pig, and I think it is most enterprising that Dr. Wokes has been able to get these people together and use them in connection with what are in effect dietetic experiments.

One question I should like to put to the lecturer: when I was dealing, many years ago, with deficiencies of vitamin A and vitamin D in the diet of London children, I think I suggested that possibly children might get too much, but Dr. Leslie Harris of Cambridge did not think that was at all likely. However, within the last few years we do know people can get too much vitamin D, and suffer from hypercalcaemia. I wonder if there is any risk of people getting too much B<sub>12</sub> and, if so, how would it be recognized?

THE LECTURER: The Chairman has certainly raised a number of interesting points and I will try to deal with them as well as I can.

First of all, I will say again how much we owe to Sir Jack Drummond for his most interesting lectures to this Society in previous years. I gained a lot of inspiration from them, and when I was discussing during the war some very vital problems with him I felt much more confident because I had just read his lectures here. I agree that in the Chairman's experiments with the orphanage children, the fact that positive results were not gained by giving vitamin B<sub>12</sub> might well have been because the children did not want it, they were not deficient in B<sub>12</sub>. That may explain several other negative results.

Next, this very debatable question about experiments on animals. I do not propose to attempt to cover the whole of that field, which is an enormous one; I will just refer to vitamin B<sub>12</sub>. With vitamin B<sub>12</sub> there is this question of the intestinal flora, which depends on the diet and also on the physiology of the animal, which obviously is very different in ruminants from non-ruminants. But my impression is that, although we may learn a lot from experiments on animals, the ultimate findings will have to be obtained on man, and that is why I think the vegans have been most valuable people to have available for obtaining these results, especially as they have really stuck to their vegan diets for many years in face of great difficulties. In this connection I might mention that we have a few of these children here who were included in some of the results I gave on the screen, and if any of the audience are interested after the meeting to speak to the children or their parents, I am sure they would be very pleased to answer any questions.

I do not think an excessive intake of vitamin B<sub>12</sub> is at all likely because, first of all, if it is given by mouth there is only a limited uptake depending on the intrinsic factor. The daily average requirement of B<sub>12</sub> is something like 2, 3, or 5 micrograms. If you give an injection of, say, 1,000 micrograms, about ninety per cent of that comes out in the urine in the first few hours. So with all those precautions I do not think there is any risk of vitamin B<sub>12</sub> producing any harmful results, and in any case I do not think that under normal conditions people are likely to use too much, as it is rather expensive. At present prices I suppose 100 micrograms would cost about two shillings.

DR. J. I. M. JONES: Everything that is measurable has two ends, a starting point and a finishing point, and this applies to living organisms as well as anything else. Dr. Wokes has dealt very lucidly with the importance of B<sub>12</sub> at the beginning of life. Now, in the present composition of human society there is an unusual preponderance



of the elderly, and it is quite an important matter that those approaching the latter end of life—the elderly and those past middle age—should be maintained in a healthy and functioning condition. This necessity has been recognized in recent years by the increased attention being paid to the sciences designated by the names of gerontology and geriatrics. I wonder if Dr. Wokes can tell us anything about the importance of  $B_{12}$  in the maintenance of the nutritional state of elderly people, who are notoriously prone to be careless in their feeding habits?

THE LECTURER: Our present knowledge seems to indicate that  $B_{12}$  is most important for children, especially young children, and that is why I dealt particularly with children in my talk; but it is also true that adults need  $B_{12}$ , and American work has shown that people in the 60s and 70s, or even older, may experience a deficiency of vitamin  $B_{12}$  if their diet is not adequate. One very interesting point which has come out of these American investigations is that the serum level of vitamin  $B_{12}$ , which you remember was found to be low in vegans, tends to become lower as people become middle-aged and older. That may not necessarily mean they have developed deficiencies, it may be they can manage with less  $B_{12}$ .

MR. G. E. SHAW asked about the possibility of absorption of  $B_{12}$  becoming less efficient with advancing age. The resulting deficiency might lead to oral signs such as had been described in the lecture. His own mother, for example, now aged 82, had suffered for some years from ulcers in the mouth which perhaps were due to such deficiency. He emphasized that statistical averages should be used with caution, and due allowance should be made for individual variations in susceptibility. Finally, he raised the question of increased requirements of  $B_{12}$  in stress conditions, such as pregnancy.

THE LECTURER: The low serum  $B_{12}$  levels in older people might be due to the fact that, although they are getting as much  $B_{12}$  as young people, they are not absorbing it so readily. This possibility could be explored by use of radio-active  $B_{12}$ . Dr. Mollin has done a certain amount of work on that. I quite agree that one must be careful about using statistics, because although we talk about an average level of vitamin  $B_{12}$ , obviously individual cases will vary quite widely. Some people might have a serum  $B_{12}$  level not much about  $200 \mu\mu/\text{ml}$  and yet apparently be all right, and other, equally healthy people might have  $B_{12}$  levels up to 800. On the other hand, one must always in this work have a number of cases; one cannot argue from a few results, and one must use statistics to discover significant differences. Finally, the point about the need for vitamin  $B_{12}$  in normal people as compared with those under conditions of stress. In pregnancy the requirement of vitamin  $B_{12}$  is definitely higher than normal. But in other stress conditions we have still got a great deal to learn. We must first of all get some idea of what the intakes of normal people are. Very little information has been obtained about the intakes of vitamin  $B_{12}$  in normal persons, how it fluctuates from season to season and from year to year. Before we can reach satisfactory conclusions about the use of  $B_{12}$  in stress conditions we must know more about the requirements of the vitamin.

DR. STANLEY GOODING: Following upon that answer: Dr. Wokes I think told us that vitamin  $B_{12}$  was synthesized by the micro-organisms of the large intestine. I wonder if he could tell us from what vitamin  $B_{12}$  is in fact synthesized? I ask that because I have in mind that bees produce royal jelly, which recently has been said to make people young again, and royal jelly is the richest animal product in vitamin  $B_6$ , and bees synthesize that from beta alanine that comes from the protein that is derived from the pollen. Vitamin  $B_6$  is also synthesized by the micro-organisms of the alimentary canal in the human being and no doubt from beta alanine too, and I was wondering if Dr. Wokes could tell us what it is in the case of vitamin  $B_{12}$ .

THE LECTURER: This question of intestinal synthesis of B vitamins is a very complex one. Many different B vitamins are synthesized in the intestine and become available from the micro-organisms. One has to imagine a most intensive intestinal activity.

Vitamin B<sub>12</sub> is only one of these vitamins, and one of the most recent ones to be studied. B<sub>6</sub> is indeed produced in the intestine like the other B vitamins. But the chemistry of B<sub>12</sub> is very different from that of B<sub>6</sub>, and I do not think that we can safely deduce from the findings on B<sub>6</sub> what may happen in the case of B<sub>12</sub>. Intestinal micro-organisms can produce a variety of B<sub>12</sub>-like vitamins in which part of the molecule varies. Only one particular type is so effective in man for the cure of pernicious anaemia. Other types of B vitamins are effective for growth promotion in micro-organisms, but they are not effective in man. There has to be a good deal of sorting out of the different B<sub>12</sub> vitamins. The human organism, however, has one safeguard in that, as I explained earlier, vitamin B<sub>12</sub> requires presence of the intrinsic factor in order to be absorbed from the intestine into the blood. This intrinsic factor is rather specific, it won't pick up the B<sub>12</sub>-like compounds anything like so readily as it picks up the true B vitamins.

DR. R. S. F. HENNESSEY: I was very interested in the lecturer's remarks about the association of B<sub>12</sub> deficiency and *Kwashiorkor*, because I saw a good many cases of *Kwashiorkor* in Africa when I was working there. It occurred to me that the incidence of *Kwashiorkor* varied considerably in certain areas of East Africa, although the practice of weaning children on to diets with very low protein content is widespread. I was wondering whether there could be any difference in particular areas where *Kwashiorkor* is either commonly seen or hardly ever seen, in respect of the availability of cobalt, which must be present if any synthesis of B<sub>12</sub> is to take place? I was going to ask the lecturer if there was anything known about the forms of cobalt which are available in different geological structures and the presence of cobalt in vegetable foods grown on particular types of soil?

THE LECTURER: I do not think *Kwashiorkor* is likely to be due to a deficiency of cobalt. As far as we know there is always enough cobalt in the diet of human beings. In animals there can be a deficiency, since they tend to live on more restricted diets and this cobalt deficiency might occur in certain districts where the soil happens to be deficient in cobalt. Regarding the occurrence of *Kwashiorkor* after the babies are weaned: now vegan babies are always on the breast for a much longer period than normal babies in this country. In native peoples it has been observed by a number of workers that babies are often kept on the breast for one or two years, when they are getting, of course, a very valuable amount of protein in the human milk. When they are weaned later on to diets very low in animal protein they may have then built up an important reserve of B<sub>12</sub>. Coming back to vegans, one vegan mother in this country did actually provide breast milk for her daughter to the age of 2 years and 8 months. That child is here to-day and one of the successful vegans.

DR. D. F. EVERED: Mr. Chairman, you have mentioned the importance of different species of animals in the interpretation of nutritional experiments. Dr. Wokes has spoken of the influence of the intrinsic factor on the absorption of vitamin B<sub>12</sub> from the small intestine. I would like to combine these two points in a question. It has been shown in human patients that after the removal of the stomach, or part of it, absorption of vitamin B<sub>12</sub> is faulty and the result is pernicious anaemia. This is one of the well-known uses of vitamin B<sub>12</sub> in the human diet. Recently there have been some experiments on rats, mainly albino rats, in which these animals were subjected to partial gastrectomy and were then injected with vitamin B<sub>12</sub> to treat the results of pernicious anaemia. They were not cured by vitamin B<sub>12</sub>, either by injection or when given orally with hog stomach. However, they were cured by feeding them aureomycin, but the depleted stores of vitamin B<sub>12</sub> in the liver were not brought back to normal.

THE LECTURER: I am afraid I cannot say much about this interesting point because it is new to me. It shows again the difficulty of transferring results from one animal species to another.

MR. B. P. ALLINSON: I have three questions. Can Dr. Wokes tell us whether

pasteurization of milk affects the content of the  $B_{12}$ ? Is it known where in the body  $B_{12}$  is stored? Have any comparisons been made between the levels of  $B_{12}$  in the blood stream of vegetarians and meat eaters as distinct from vegans?

THE LECTURER: Pasteurization has very little effect, and destroys only about 6 per cent of vitamin  $B_{12}$ . The second point was where it is stored in the body. In the liver of course, that is the great source. With regard to the last question, no, I do not know of any comparison of the serum  $B_{12}$  levels in vegans with those in vegetarians. In Professor Stare's laboratory in Boston, where they also studied vegans, they included some vegetarians and studied their general health, but unfortunately they did not measure the serum  $B_{12}$  level in the vegetarians. My guess would be that it is between that of the vegans and that of normal people, but of course it depends very much on the intake of the vitamin.

MRS. E. B. SHRIGLEY: I have been a vegan for about 13½ years. I would like to ask Dr. Wokes if he has made any study of the emotional make up of the vegans he has studied? I have been on the Executive Committee and President of the Vegan Society for five years so I have been behind the scenes of the Vegan Movement and I have been very much troubled by the fact that, while healthy vegans are for the most part emotionally stable, many of the vegans who have been ill have either been on a very bad diet or have been a little emotionally unstable. I would like to ask Dr. Wokes whether, before he said why some vegans manage on a low  $B_{12}$  level whilst others have a high level, he realized that whilst some vegans live and work in a very harmonious atmosphere, others work in difficult surroundings, where the emotions are upset. The other thing I wish to say is that many vegans are living on raw food only. Thus they are getting more protein from green leaves. The best diet for vegans is considered to be raw food that comes from healthy soil, soil that has had no chemical fertilisers on it. I wonder if Dr. Wokes would agree to that and does he think it is the correct diet for a vegan? One last question: Dr. Wokes talks about cyanide and vitamin  $B_{12}$ . Will he please tell us where does the cyanide come from and what foods does it come in, and how does it get into the body?

THE LECTURER: The question of emotional make up of vegans is a difficult one. I have not attempted to study that side scientifically whilst mixing with the vegans, and would not like to say that my observations provide sufficient basis to express a considered opinion. I would make this suggestion, however: even although one might observe in some vegans some psychological differences as compared to other humans, one must be very careful about saying that because they were unduly emotional there was a deficiency of  $B_{12}$ . On this question of raw foods obviously the intestinal flora can be influenced by the diet. An intake of raw starch, for example, has been shown to increase the intestinal content of *E. coli* (which is one of the synthesizers of  $B_{12}$ ). When vegans consume large amounts of raw vegetables, such as root vegetables, which contain a good deal of starch, this may well have a definite effect on the intestinal flora. Cyanide occurs, though only in very minute quantities, in a number of foods, many more foods than you might think. We investigated this in our laboratories some years ago, and we determined cyanide in a number of staple foods—mainly seeds. One can get quite a fair amount of cyanide by eating those foods. Cyanide is also produced by certain metabolic processes. There is always a certain amount of metabolic cyanide in the body.

THE CHAIRMAN: I am sure we should all like to express our very warm appreciation to Dr. Wokes for his most illuminating address. It was very definitely not a scissors and paste address, if I may say so, but one arising from his own very important work, which he has described to us so ably, both in the lecture itself, and, indirectly, in the subsequent cross-examination, which I think you will all agree he has survived extremely well!

*The vote of thanks to the Lecturer was carried with acclamation and, another having been accorded to the Chairman, the meeting then ended.*

## GENERAL NOTES

## NEW LONDON PREMISES FOR THE TROPICAL PRODUCTS INSTITUTE

The first major removal from the Imperial Institute, to make way for its demolition, has been completed. The former Colonial Products Laboratory now occupies new premises at 56/62 Gray's Inn Road, London, W.C.1. The name of this organization has also been changed to The Tropical Products Institute, in anticipation of the enlargement of its function to include advising and assisting territories in tropical and sub-tropical regions which are not necessarily colonies—in particular, those countries which have recently acquired independence within the Commonwealth. It is emphasized, however, that the Institute will continue to work on behalf of all colonial territories, tropical, sub-tropical and temperate.

The Gray's Inn Road building, which has been adapted for the Institute by the Ministry of Works, provides good accommodation on several floors. Eight self-contained laboratories, including one for making paper, will be devoted to advisory and educational work on the main groups of plant and animal products of the tropics. Six other laboratories will conduct rather more fundamental research on subjects which have a bearing on the needs and problems of sub-tropical areas; and an additional six will provide general supporting facilities, such as the chromatography laboratories and the sample grinding room. There will also be a pilot plant laboratory and a workshop.

The building has a small museum, and a conference room which can be used for lectures and film shows. The Institute library, consisting of some 150,000 items, is housed in two large rooms, one of which will be open to the public for reference purposes early in the New Year, on Mondays to Fridays, between 10 a.m. and 5 p.m.

## TOWN AND COUNTRY COLOURS FOR INTERIOR DECORATION

In a stimulating and imaginatively displayed exhibition at 13 Portman Square, W.1, the British Colour Council is showing its new range of co-ordinated 'Town and Country Colours' for interior decoration and furnishing. Designed to assist manufacturers in different industries by promoting colours which blend when used together, the exhibition gives promise of a welcome gaiety and brightness in 1958, when the merchandise it inspires will be on sale to the public.

The difficulty of matching colours and translating them from one surface or texture to another is well known. Quite apart from their splendour, a great practical advantage of the 55 'Town and Country Colours' is that they are here presented on different surfaces, including not only gloss and matt finishes but also carpet yarn and furnishing fabric. The visitor who first inspects the panels on which these specimens are shown, may then see, in a number of attractive room-settings, how the colours have been applied to a wide range of decorative materials.

The exhibition, which was visited by H.R.H. The Princess Margaret on 5th December, is open to Fellows until 17th January (excluding Christmas week) at the following times: Mondays to Fridays, 11 a.m. to 4.30 p.m. There is no charge for admission.

## VICTORIAN EXHIBITION AT BETHNAL GREEN

The changes in Victorian taste and fashion through which, in the next two months, the visitor to the Bethnal Green Museum may travel, vividly reflect those qualities we most readily attribute to our ancestors. But by skilful choice of objects for display the organizers of this exhibition have evoked such apparently conflicting strains—romance and raffishness as well as respectability; fervour as well as sentimentality—that any glib attempt at synthesis, much less definition, is baffled. Charles Auchester's presence seems as real as George du Maurier's.

The exhibition, which covers the whole span of the Queen's reign, is mainly confined to Victoriana exhibitable in frames, and ranges from the exquisite autograph music score of Mendelssohn's 'Hear my prayer . . .' to original drawings for *Punch* by leading Victorian illustrators; from sugary Valentine cards to sombre photographs of celebrities. For the occasion the museum has also drawn on its remarkable collection of drawings by George Cruikshank, including some from the series in which he depicted the fate of 'The Drunkard's Children'. If these cause the spectator to recoil, the delightful selection of music titles, Baxter prints, and theatrical posters quickly entice him back.

Except for Christmas Day, the exhibition is open at the Museum in Cambridge Heath Road, E.2, until 2nd March, 1958, on every weekday from 10 a.m. to 6 p.m., and on Sundays from 2.30 to 6 p.m. There is no charge for admission.

#### EXHIBITION OF CANADIAN ESKIMO ART

Very remote in spirit from Victorian England are the Canadian Eskimo carvings and sculpture now being shown at the Imperial Institute in South Kensington. Lord Tweedsmuir, in introducing the exhibition at a reception held on 11th December, described the art of these people as one which 'owes nothing to that of any other race', and which derives its force from a way of life 'spent in a balance of nature with the animal'. There are about 100 exhibits, in bone, ivory and stone, supported by some remarkable photographs. They will remain on view in the Canadian Gallery of the Institute until 12th January at the following times: Mondays to Fridays, 10 a.m. to 4.30 p.m.; Saturdays, 10 a.m. to 5 p.m.; Sundays, 2.30 p.m. to 6 p.m.

#### PRODUCTION EXHIBITION AND CONFERENCE, 1958

It is announced that the Minister of Power, Lord Mills, is to open the Third Production Exhibition and Conference which will be held at Olympia from 12th to 21st May, 1958. The President of the Exhibition and Conference will be the Earl of Halsbury, President of the Institution of Production Engineers, who are sponsors of the venture.

The theme of both Exhibition and Conference is 'Production Fights Inflation', and the purpose is to place before the public examples of some of the best production technology employed in this country, and to show how the work of scientists, designers and development engineers is passed on to the consumer as a result of modern production technology. The exhibition itself will differ from the generality of such displays in that its presentation is to be technical: many of the stands will be manned by scientists and technologists who can explain their work to those who visit the Exhibition. The exhibition will also emphasize the importance of Design in production.

Firms who would like to take part in the Exhibition may obtain full information from Andry Montgomery Ltd., 32 Millbank, London, S.W.1. Enquiries about the Conference should be addressed to the Press Officer, Institution of Production Engineers, 10 Chesterfield Street, London, W.1.

#### CONFERENCE ON ELECTRONIC DATA PROCESSING

On 28th January, 1958, the Office Management Association (Birmingham Branch) is sponsoring a one-day conference on 'Electronic Data Processing' at the Botanical Gardens, Edgbaston, Birmingham, 15. At the morning session, Mr. G. H. S. Jordan, of H.M. Treasury, will deliver an address on 'Electronic Data Processing in the U.S.A.'. In the afternoon, Mr. C. F. Howell, Director of Norcross and Partners Ltd., will address the conference on 'Paving the Way for Electronics'. There will also be a display of literature, photographs and models by the leading manufacturers of equipment in the computer field.

Further details may be obtained from the Conference Convenor, E. C. Blewitt, at Swallow Reincoats Ltd., Birmingham, 18 (telephone Northern 3386).



## OBITUARY

We record with regret the death of three Fellows of the Society.

## SIR ERNEST OPPENHEIMER

Sir Ernest Oppenheimer, who died in Johannesburg on 25th November, at the age of 77, had for many years been the leading figure in the South African diamond industry, widely respected alike for his mastery of affairs and his private and more personal qualities.

The son of Edward Oppenheimer, he was born at Friedberg, Hesse, on 22nd May, 1880. As a youth he worked in London for Dunkelsbuhlers, the diamond merchants, and in 1902 went out to Kimberley as their representative. His abilities were rapidly proved, and in a few years won him great influence, not only in the diamond trade and the South African business world generally, but in municipal affairs, and thence political life. As Mayor of Kimberley in 1913-15, he was largely responsible for raising the Kimberley Regiment for active service in the war.

In 1917 Oppenheimer formed the Anglo-American Corporation of South Africa. Under his direction, and backed by his remarkable grasp of finance, this enterprise developed vast interests in the mining industry at large. Within his particular sphere of diamonds, as the number of his chairmanships increased, so Oppenheimer's position steadily grew in importance, until, with his election as Chairman of De Beers in 1929, it became a dominating one. The soundness of his judgment and business methods may be measured by the fact that, in spite of great losses, his companies survived the slump of the early 1930s essentially intact. He remained Chairman of the Anglo-American Corporation until the end of his life.

Oppenheimer was knighted in 1921. He entered the Union Parliament in 1924 as Member for Kimberley, and sat until 1938. A friend of General Smuts, and representing vital elements in the country's economy, he carried his authority naturally into politics and became one of the leaders of the South African party.

It is a mark of Oppenheimer's achievement that, as he went from success to success, he made no enemies and many friends. His family life was happy, his tastes simple, and his philanthropy genuine but unobtrusive. He did much for the improvement of African living conditions. It should be remembered that he gave £100,000 towards the foundation of Queen Elizabeth House, Oxford, a university to which he had a particular attachment, where he encouraged the development of Commonwealth studies, and which, in turn, honoured him with the Honorary degree of D.C.L. in 1952.

Sir Ernest Oppenheimer was elected a Life Fellow of the Society in 1937.

## MR. W. T. CURTIS-WILLSON

Mr. W. T. Curtis-Willson, M.B.E., who died in Brighton on 4th December at the age of 69, had, in spite of blindness and a late beginning, made a prominent place for himself in the newspaper industry.

He was born in 1888, and educated at Tottenham Grammar School. A shrapnel wound in the First World War deprived him of the sight of one eye and seriously damaged that of the other; but, after a course of training at St. Dunstan's, he was nevertheless able, as proprietor of the *Brighton and Hove Herald*, to become a well-known figure in provincial journalism. In 1942 total blindness found him fully prepared and determined. He extended his activities, not only in his own profession, but on behalf of the Royal National Institute for the Blind and the Empire Society for the Blind. Though so gravely handicapped, he responded at once to the demands of the Second World War. As President of the Federation of Home and Southern Counties Newspaper Proprietors Association he did important work in dealing first

with exemptions from military service and, when hostilities were over, with priorities in demobilization. During the war he also raised and commanded five squadrons of the Air Training Corps, and held the rank of Wing-Commander R.A.F.V.R. (T).

In 1950 Curtis-Willson became President of the Newspaper Society, and in 1953 President of the International Federation of the Press. The latter office involved him in extensive travel. He also served on the Council of the Commonwealth Press Union. Particular mention should be made of the valuable advice and assistance which he gave to the Press Council in its early days.

Mr. Curtis-Willson was elected a Fellow of the Society in 1952.

#### MR. F. G. CREED

Mr. Frederick George Creed, who died at Croydon on 11th December, aged 86, was well known as an inventor, particularly in connection with the Teleprinter system which bears his name.

He was born in Nova Scotia, and came to this country in 1902. In those days news was much slower in reaching the press than it is to-day, and Creed's idea for a new and rapid system of communication, which he perfected in a workshop in Glasgow, and first installed in Fleet Street in 1912, was to prove of great benefit to all those concerned with the dissemination of news at high speed. In December, 1920, in the course of an Inaugural Address by the late Alan Campbell Swinton, F.R.S., then Chairman of Council, on 'Wireless Telegraphy and Telephony', Creed gave the first public demonstration of teleprinting by wireless, a special message being sent from the Eiffel Tower for the occasion. His receiver was fully described and illustrated in Mr. Campbell Swinton's address (*Journal*, Vol. LXIX, 3rd December, 1920, pp. 28-33).

During the Second World War Mr. Creed was Consultant to the Admiralty on small ship designing, and amongst his many inventions should be mentioned a double-hulled ship which he believed was unsinkable (see his description of it in the *Journal*, Vol. XCVIII, 18th November, 1949, p. 897), and a floating sea-drome, supported by floats consisting of hollow cylinders.

Mr. Creed was elected a Fellow of the Society in 1921.

### NOTES ON BOOKS

A HISTORY OF PUNCH. By R. G. G. Price. London, Collins, 1957. 30s net

There are two main approaches to the writing of a new history of *Punch*, which surprisingly has not been published until now since Spielmann's diligent work in 1895. An external review of Mr. Punch's career, since his obstreperous birth in 1841, might concentrate only on the dominant figures of the Table, studying, in particular, the influence of the periodical on changing public opinion, and relating its manners of humour and drawing to contemporary society with such knowledge as Mr. Laver, say, possesses. Mr. Price, an admirable journalist associated with *Punch* for a number of years now, has written his detailed chronicle from inside, stuffing it with names on Bradbury and Evans' (later Bradbury and Agnew's) pay-roll, and primarily addressing those of us, nursed on Tenniel or Partridge, who cherish our dusty volumes in red leather.

Perhaps the main fault of Mr. Price's book—and its virtues easily outweigh it—is the indication that not all his immense research has been assimilated, selected, and so far as possible concealed. In one of the six appendices, he prints notes on his sources, e.g., 'the Editorial Department has some folders of miscellaneous material, some kept in the basement' etc., of no interest whatever outside the office, where any future historian would naturally apply. But such defects should not deter anyone from reading (with a little judicious skipping) a volume whose value lies chiefly in

an impartial scrutiny of the editors from Mark Lemon, who guided the threepenny enterprise with an initial circulation of 6,000 (writing farces to pay the bills), to Mr. Malcolm Muggeridge who, before his recent departure, restored something of *Punch's* early polemical character.

It is curious how many elderly readers there are who, looking back nostalgically to Owen Seaman's reign (1906-32), would like to see *Punch* still pulling his punches, presenting the same kind of mild, rather donnish humour, and continuing the Seaman tradition of distrust in any serious experiment in the arts that disturbed complacency. Mr. Price has no illusions. 'How inconceivable it is', he remarks, 'to think of Seaman's using Max Beerbohm. How inconceivable it is to think of Lemon's not doing so.' What is so excellent, indeed, about this book is the author's sense of continuity, his just comparisons of one régime with another and, above all, his recognition of the spirited things (he is an admirable judge particularly of verse) in any seemingly spiritless period. Thus he draws attention to the continuous vitality of A. P. Herbert, among others, in the years between the wars, quoting to effect his nimble verse written in 1919:

Ah, what a night! The cannon roared;  
There was no food to spare;  
And first it froze and then it poured;  
Were we dismayed? We were.  
Three hundred yards we went or more  
And, when we reached, through seas of gore,  
The village we were fighting for,  
The Germans were not there.

It is the quality of such lively contributions as this, as much as the attraction of the best graphic artists to *Punch*, which has enabled it to outlive all its competitors at home. Mr. Price mentions the Victorian *Fun* (which actually lasted thirty years), besides *Judy*, *Ally Sloper's Half-Holiday*, and Harry Furniss' uncertain squib, *Lika Joko*—titles that seem condemned to impermanence. *The Humorist* of more recent times is not mentioned, nor, surprisingly, is *Night and Day*, that witty and sophisticated magazine with brilliant drawings, which really did cause a flutter in the *Punch* office during its brief run.

It would be interesting to know to what extent the *jeux d'esprit* of Bovey and Topolski in *Night and Day* brought about the disappearance of the printed joke beneath the naturalistic drawing, and the gradual substitution of the grotesque conceit. Obviously *The New Yorker* school of artists, attentive to the ambiguous fantasies of Paul Klee, has affected the transformation in Bouverie Street, but on this Mr. Price is silent. Though his pages are interspersed with *Punch* drawings, he is concerned more with styles of writing, and he very properly leaves Mr. Kenneth Bird ('Fougasse') to discuss drawing and methods of reproduction in an appendix.

Mr. Bird, who was editor at the time of his visit to the exhibition of humorous art arranged by Mr. H. M. Bateman in the Royal Society of Arts' library, interestingly suggests here that the present importance given to the immediate impact of a drawing has been due to the advent of the cinema and radio. 'The reader found that with radio and talking films he could no longer refer back or "recap"; he had to listen the first time.' Mr. Bird goes on to reflect that 'television will in time bring another change, but not, probably, such a great one, since the psychological effect of TV is more or less the same'.

That may well be so, though it is always possible that a revulsion of public taste may see again a more realistic and 'literary' illustration, in a modern idiom, however. Social Realism is, after all, an active force in contemporary painting. Such are the thoughts prompted by this fascinating history, which will make a valuable addition to the Society's library.

NEVILLE WALLIS

THE PENROSE ANNUAL. A REVIEW OF THE GRAPHIC ARTS. VOLUME 51, 1957. *London, Lund Humphries. 35s net*

For the sixteenth and, unfortunately, the last time, the *Penrose Annual* bears the words 'Edited by R. B. Fishenden' on its title-page; R. B. F. died in October, 1956, in his 77th year, having completed the majority of the editorial work for this volume. In its pages he is doubly commemorated. There is firstly an 'In Memoriam' by Beatrice Warde, which well brings out the many-sidedness of the man, the possessor 'in this dangerously over-specialized twentieth century . . . of a truly synoptic mind—a mind capable of thrusting its curiosity avidly outward through a whole pattern of linked activities'. Secondly, the Annual itself is his memorial, for the 'whole pattern' of it, the breadth of technical and æsthetic knowledge and appreciation shown in it, is a reflection of his own unique understanding. The letters which follow his name on the title-page, O.B.E., Hon. F.R.P.S., Hon. F.S.I.A., may be said to symbolize and pay tribute to his achievements in printing, and in technical work, and in design.

The editorial commentary this year is written by Mr. R. S. Hutchings, who sees 'increasing speeds, simplifications, and increasing flexibility in the co-ordination of consecutive operations' as the chief tendencies in technical advance. Speed means research into questions such as 'The Forces involved in the Transfer of Printing Inks', by Charles H. Borchers; simplifications can be seen in 'The 3M Brand Make-ready Process', in 'The Colour Klischograph', or in 'The Kodak Short-Run Colour Process'. These are, of course, simplifications not of apparatus, but of hand work. The third line of development implies increasing use of electronic equipment, such as in 'Ink Density Measurement and Colour Quality Control'. In short, when, as in present economic circumstances, so much depends on increasing production, and when this in turn depends on technical progress, 'it is difficult', as Sir James Waterlow says in the opening words of his article on 'Research in Relation to Printing', 'to understand why there are so many printers in this country who do not recognize the value of research'.

In the 'graphic arts', however, there is still work for the hand and eye. Mr. Charles Rosner writes succinctly on the 'Alliance Graphique Internationale'. His illustrations speak for themselves. Since they are by such masters as Savignac and Eckersley this they do without need of language, and thereby make Mr. Rosner's point. Incidentally Mr. Rosner is probably the first *Penrose* writer to introduce a mention of cavemen.

Mr. David Bland writes, accompanied by some interesting illustrations, under the slightly ambiguous title, 'The Influence of Reproductive Techniques on Book Illustration', and comes to the conclusion that 'the strict discipline of the page and the reproductive technique under which the illustrator labours need not be anything but salutary'. This is particularly the case if the artist himself prepares the printing surface, as in the so-called autographic methods. Some excellent examples of autolithography are to be found in the Puffin Picture Books, a 'Century' of which is celebrated in a valuable article by Mr. Noel Carrington, the originator of the series.

There are three articles on aspects of photography, one on 'Architectural Photography', by Professor Nikolaus Pevsner, 'Training for Photography', by Mr. Ashley Havinden, and 'Henri Cartier-Bresson: Notes on the Relation of Photography and Painting', by Mr. Basil Taylor. The latter subject has lately been under debate in the correspondence columns of *The Times*. Mr. Taylor, however, does not hesitate to say that even such photographs as Cartier-Bresson's are 'most delusive and dangerous as an influence upon the painter'.

Type and lettering subjects are discussed by Mr. Herbert Spencer, Mr. Will Carter (on his new type-face, Klang) and Mr. John Dreyfus (on street lettering).

Mr. Herbert Simon contributes 'A Note on Oliver Simon' of the Curwen Press

which brings out the background to a career, entered into almost by chance, which has had a notable effect on the face of 'The English Book'. It is fitting that Mr. Alan Pryce-Jones, who writes under this latter title, singles out the Novel Library, whose style was set by Oliver Simon, as volumes '... so elegant in form that they lead anyone with a feeling for appearances to read books which otherwise might have stood for ever unopened'. Those who say that British books look dull in international company will be surprised to find Mr. Pryce-Jones speaking of the sense of gaiety of English books compared with others which he saw on Genevan shelves. And by international standards the average price of English books is low, a fact too often ignored.

Also well worth study is a scholarly article on 'Decorated Papers' by Olga Hirsch, with excellent illustrations. Here, indeed, is a source of graphic interest and gaiety appreciated only in a few quarters, of which the Curwen Press is one.

Unfortunately, the particular copy under review is not well printed. A number of the pages are grey, and some over-printed captions show a bad slur. Even to say that this is unusual would be an insult; it is to be hoped that this copy is unique. One takes for granted now in Penrose the excellence of the printed matter and the printing.

MICHAEL OLIVER

CRAFTSMANSHIP AND DESIGN IN POTTERY. By W. B. Dalton. London, Pitman, 1957. 42s net

Mr. W. B. Dalton's essay is written in that happy infectious spirit which compels attention even when his generalizations are most challenging and provocative.

The book is divided into two sections: the first, dealing with 'Our Heritage', discusses the pottery of Greece, Cyprus, Rome, Persia and the Near East, medieval English pottery and the wares of the seventeenth and eighteenth centuries, Italian maiolica, and the stoneware and porcelain of China; the second is concerned with workshop practice. Each has an appropriate group of half-tone illustrations, which are supplemented by colour plates and line drawings. The book is completed by a series of appendices giving a colour scale of temperatures, trade information concerning the use of Orton Standard Pyrometric Cones and Pyramid Seger Cones, and information about clays, miscellaneous pottery bodies and glaze materials. There are also a glossary, bibliography and index.

One may be forgiven for turning to the second half first, because this is probably the most useful and certainly the best part of the book. Out of a long and rich teaching experience and extended pottery research the author discusses the preparation of the potter's materials, his tools and equipment, his kiln and kiln-firing, workshop routine and design, illustrating his thesis with pages from his firing records and remarkable coloured illustrations of his own glaze trials.

The sense of orderliness which is the hall mark of a good craftsman is evident in all Mr. Dalton's work. The careful detailing of the equipment and arrangement of his cellar-workshop is matched by the thoroughness with which he unfolds the story of pottery making through all its stages. Some of the most fascinating chapters are those concerning the materials of porcelain and stoneware glazes, the preparation and testing of wood ashes, and the effect of colouring oxides upon glazes fired under different conditions. In all this, Mr. Dalton reveals himself as a tireless student, studying perfection as he has experienced it in the ceramics of China or Persia, in order that he may achieve perfection or near-perfection himself. Every trial is tabulated; glaze formulas are given and their characteristics described.

Lest the reader should imagine that this is a dull factual book (it contains, of course, much information), I should perhaps add that I have rarely read a more eloquent description of the firing of a kiln. Mr. Dalton takes the reader through every stage of this hazardous culminating ordeal, enabling him to share something of the suspense



and excitement of his own experience. 'The excitement of a firing is still alive within me. At night uncertainty disturbs rest. It ticks out the minutes—is there a possibility of some pot crawling or dunting? A little restlessness is also centred on Orton Cone 12. Has the deduction from its appearance been correct? A flashlight peep would tell me, but it is too early for that yet. Sleep must have come with Cone 12.'

The first half of the book consists, I should imagine, of jottings from the author's museum notebooks. Mr. Dalton is not careful here to preserve a sense of proportion, but is swayed by the necessity to present useful information concerning the merit, character or technique of individual pots. Roman pottery, therefore, which he admits when viewed in the mass 'is not of high standard', is accorded nearly three pages, whereas Greek pottery, which he believes to be underrated, receives but one. German salt-glazed stoneware is dismissed in a couple of lines.

Many of Mr. Dalton's comments are arresting, as for example, when with reference to a Florentine oak-leaf jug he writes of the 'masculine strength of the blobs that make the oak leaves, and the . . . easy light-handed delicacy of the connecting lines that tauntingly ripple over the surface of the pitcher to bind the leaves together', or his description of the expressive energy of the relief decoration upon a medieval pot—'It's all go and guts even to the dots'. The book is full of things of this sort. The 'daring' of the artist-craftsman is well brought out in word and picture. Illustrations of this are provided by the Gubbio drug-pot with its immense twisted handles, and the T'ang ovoid ewer uneasily balanced upon its carefully trimmed foot.

There are times when one may feel inclined to quarrel with his findings. The pre-eminence of Emile Decoeur (Mr. Dalton says of him, 'Without distorting technicalities Decoeur reached a world of pottery perfection in form and glazes . . .') is hardly sustained by the illustrations of his work. Again, the somewhat startling grouping of Sung pottery with Florence, Gubbio and Luca della Robbia under the heading 'Renaissance', with Italy filling a minor rôle, could only be upheld by a carefully reasoned philosophy of art history which Mr. Dalton does not provide.

These apart, *Craftsmanship and Design in Pottery* is one of the few books on the designing and making of pottery published in the last quarter of a century worthy of a place beside Bernard Leach's *A Potter's Book*. As a teacher and pioneer craftsman, W. B. Dalton has had an influence which will be further extended by this excellent work.

REGINALD G. HAGGAR

ANTIQUÉ JEWELLERY. By Erich Steingraber, trs. by Peter Gorge. London, Thames & Hudson, 1957. 63s net

From century to century antique jewellery changed fundamentally in function and in style. Jewels have been administered as medicine and worn, stone by stone, for their specific powers of protection. They have adorned love tokens for the troubadour, and memorials for the sentimental late Georgian Englishman. Religious ornaments served the medieval cult of the relic; coin favours were mass-produced for distribution by travelling princelings, and decorative honours were long retained by picturesque but otherwise outmoded knightly orders, among which, incidentally, the English Collar of SS still awaits certain identification. Always, however, jewellery was regarded fundamentally as a treasured part of the privileged social order that invested it with symbolic ceremonial importance. Not until the nineteenth century did it lose its significance and become merely a form of dressing up.

Such is the theme of this most attractively produced book. It is really splendidly illustrated with 333 brilliantly clear photographs and eight whole or part pages of exquisite colour work. Indeed the attempt to produce sparkling illustrations has been made at the expense of the reading matter, for the pages are somewhat tiresomely glossy: instead of the jewels it is the words that dazzle.

The survey extends from ancient 'lapidary science', through the aristocratic

jewellery of Charlemagne, delicate Gothic dress ornament, Burgundian court opulence, middle-class riches of the late Middle Ages, the grace of the Renaissance, Spain's spectacular 'golden age', the elevation of the diamond, the eighteenth century's rococo sparkle, and last century's grandiose confusions. Always the author's aim is to fill in the background, tracing down the years man's whole attitude to masculine grandeur and feminine beauty, and discussing the developments of resources and tools that led jewellers to forsake the jewel's mellow glow in favour of the brilliant cut.

That is perhaps enough to ask of any writer on such a vast subject. Two-thirds of the book are filled before the author arrives even in the seventeenth century. Thirty photographs have to cover all the fascinating variety of the prolific eighteenth century. Even the index is notably incomplete. The reader may conclude perhaps that such a wide survey cannot be covered so briefly and yet attain the authoritative standing expected from the custodian of the Bavarian National Museum, claimed by the publishers to be Germany's most eminent expert on antique jewellery. It is perhaps significant that the author refers to his 'most important debt' to the uniquely arranged jewellery at the Victoria and Albert Museum, London, and declares too that 'my undertaking would not have been possible without the invaluable English contributions to the subject. I refer with deep gratitude to the work of H. Clifford Smith and Joan Evans'. This country receives extremely scant mention in the book, too inadequate for any useful criticism of its accuracy. But, as the author indicates, we have our own authoritative sources.

Mr. Steingraber looks far beyond the preparation of jewels themselves, which indeed was still rare even in the fourteenth century. The various enamel effects, for example, are fascinating in their complexity. One of the coloured illustrations shows a notable fifteenth-century combination of portrait cameo chalcedony and enamelled gold repousse for the sitter's fur-trimmed robes. Enamel work appeared at its most fantastic in the early seventeenth-century's *émail en résille sur verre*, in which the subject was cut into blue glass or crystal, foil backed, and the hollows lined with gold foil and filled with translucent enamel colours. But by the eighteenth century enamelling was of little importance, declares the author, since the back of a piece of jewellery had become of no moment.

Since his interest lies mainly in the work of finest quality, Mr. Steingraber tends to dismiss the majority of eighteenth-century creations with a glance. Thus he barely mentions the ubiquitous strass paste, Bristol's crystal cutting, Birmingham's cut-steel work, the pinchbeck alloys, and cheap mass-produced Wedgwood plaques. His heart, one feels, is in earlier epochs, and it is significant, perhaps, that one of the most lovely coloured illustrations is of a fibula dating to the end of the tenth century.

G. BERNARD HUGHES

SPORTS BUILDINGS AND PLAYING FIELDS. By Richard Sudell and D. Temnyson Waters. London, Batsford, 1957. 63s. net.

Glancing through this book, as one sometimes does before settling down to read, my first impression was: here is a book on sports buildings and playing fields which are akin to one another, and where domestic architecture and landscape architecture should be co-ordinated. This is precisely what has been achieved by the authors, and we are getting the best of both worlds. I have always been a strong advocate for this liaison, and few could appreciate this point more than myself as the Chief Officer of the largest parks system in the world.

This is a technical book, published in a very compact edition, which will be most useful to officers of a local authority, both architects and town planners, to the professional man in this walk of life, and—as Sir George Pepler so capably explains in the Foreword—to all those who are interested in sport or the furtherance of sport in all its aspects. The wealth of detail and the practical advice given are of great

importance, especially to our future students of these two professions. Design in landscape and architecture may change from generation to generation but the basic principles remain.

The delight of this book is that it provides an outline of its particular subject from site survey to buildings and layout, type of soil and conditions, drainage, heating, turf and its treatment and application of fertilizers. This is not only of practical value to the architect but equally important to the groundsman or gardener who has to maintain the work of the professional man. It is admittedly difficult to learn all about turf or garden maintenance from any book, and the authors can only give a guide, but this has been most admirably submitted.

Perhaps it is not easy to give any guide as to cost, owing to fluctuating prices and changing conditions, but I personally would have enjoyed a section on Specifications and Bills of Quantities. This would have given an indication of the importance of this work and an insight to the contractor's side of it, as there exists a very big difference between the Specification of a building and that of landscape, golf course, bowling green or playing field. But details of costs apart, how good it is to read in this book that good planning is itself an economy.

It is interesting and satisfactory to note that the authors have included natural feature playgrounds for imaginative play (a word which I think describes what children require). This type of playground has proved to be very popular in Greater London—cheap to build and easy to supervise—and incidentally is helping to solve for the parks and open spaces authorities the problem of destruction of shrub and tree amenities. When this first edition runs out, as it certainly will, I hope the authors will find space to publish a paragraph, and an illustration or two, on children's playrooms and their equipment, also the possibility of the use in the winter of buildings, such as bowls pavilions, by old folk for reading and games such as dominoes and chess.

The illustrations are pleasing, and the drawings are in simple line and easy for both experts and laymen to follow and understand. The diagrammatic sketches, most of which are given dimensions, are excellent and useful and can be recommended not only to those who are taking examinations in subjects to which this book addresses itself but also to those whose subject is landscape gardening, building construction or public works. The most impatient person must be reconciled with the easy index, list of illustrations and clearly marked headings, and it is simple to find nearly every detail concerning sports buildings and playing fields.

One could perhaps enlarge upon certain subjects, but there is very little Mr. Sudell and Mr. Waters have omitted from this comprehensive book. We must thank them for their contribution to æsthetic ideas for saving and making the best of present conditions, especially for our great cities. May their book be read and studied by all who have sport and recreation at heart.

L. A. HUDDART

### SHORT NOTES ON OTHER BOOKS

SCULPTURE IN PAPER. By Bruce Angrave. London, *The Studio*, 1957. 25s net.

No. 72 in the 'How to do it' series is at once an acknowledgement of the growing use and popularity of paper sculpture in advertising and display, a careful, workman-like account of the principles of its construction, and a well-produced book. Mr. Angrave is concerned not only to give practical instruction to the beginner, but also to put the claims of paper-sculpture as an art form. From the description of his own experience and methods of working, it is clear that the medium calls for a well-developed sense of form and design in addition to skill and ingenuity. The numerous illustrations include examples of work by outstanding practitioners in different parts of the world.

STATISTICAL SOURCES FOR MARKET RESEARCH. *London, The Market Research Society in association with The Oakwood Press, 1957. 10s 6d net.*

The purpose of this reference work is to present a survey of the sources of statistical information relating to the economy of the United Kingdom. The main emphasis is on those fields which are of interest to all engaged in market research, such as population and vital statistics, the distribution of manpower in industry, output in the main industries, housing, retail trade and distribution, external trade and finance.

TIMBER: ITS DEVELOPMENT AND DISTRIBUTION. *By Brian Latham. London, Harrap, 1957. 25s net.*

This popularly written survey, ranging from the twelfth century to the present day, is packed tight with information of both historical and practical interest. The subject is viewed chiefly in relation to Great Britain, but the Canadian and American lumber trades are also dealt with. There are separate chapters on mahogany, teak and oak, and useful accounts of the construction of timber-framed houses and ships. Bound in with this copy is a brief history of the firm of James Latham Ltd., which celebrated its bicentenary in 1957.

THE SCIENCE MUSEUM. THE FIRST HUNDRED YEARS. *London, H.M.S.O., 1957. 15s net.*

This commemorative volume falls into two parts: the first traces the development of the Museum since 1857; the second contains a series of articles describing a selection of twenty-one of the historic exhibits which have been acquired during that period, ranging in date from the Wells Cathedral clock (1392) to Britain's first jet-propelled aircraft (1941). The work is handsomely produced, with many excellent photographs.

HOW TO DRAW BRIDGES. *By W. P. Robins. London, The Studio, 1957. 5s net*

The importance of good construction is particularly emphasized in this student's guide to a feat of draughtsmanship which presents special difficulties. Fully illustrated with Mr. Robins' own accomplished drawings and diagrams, it shows bridges of widely differing kinds and sizes, from a fallen tree to Waterloo Bridge.

THE LAW OF THE CARRIAGE OF GOODS BY LAND, SEA AND AIR. *By Jasper Ridley, London, Shaw, 1957. 25s*

An authoritative work covering all aspects of the law of carriage of goods, as in force on 1st January, 1957, in so far as it affects the relationship between carrier and trader. Written both for the student and the practitioner of law, it will be particularly useful to the latter by virtue of its extensive case references. There are sixty chapters, tables of statutes and cases cited, and a searching index.

## FROM THE JOURNAL OF 1858

VOLUME VI. 1st January, 1858

### THE EXAMINATION QUESTION

*From a letter written by W. Bridges Adams*

The country of maximum Examination is, probably, China; the country of minimum Examination and haphazard is England. How far an extended system of Examination in England will stimulate, and how far it will induce very respectable mediocrity is well worth an experiment, and it would be well for the Society, while keeping a record of those who take prizes, to keep also a record of their after-progress in the actual business of life. Self-taught men rarely seek for examination; they use their knowledge rather than display it, and it may be worth while to consider how far Examination is valuable other than as patronage. If it be patronage, there is

a chance of its degenerating into mere favouritism and routine. How many Examiners can be found, earnest as well as intellectual men, if the system of Examination is to become universal, to ensure that only the worthy obtain the prizes? I can understand a select body working well, but not the mass. Every human being is an individual, and to test all individuals by the same sets of questions would be a fallacy. The Examiner then should be a moral as well as intellectual philosopher, or he will only be a kind of grinder's tool, a hard materialist, and, inasmuch as the world, after all, is ruled by instincts and sympathies more than by mere brains, it is quite impossible that the system of examinations should develop more than mechanical servants, except under the care of certain select guides and first-class philosophers. The possession of godlike attributes in a teacher induces disciples of similar faculties to gather round him, but he cannot create them.

### Some Activities of Other Societies and Organizations

#### MEETINGS

WED. 1 JAN. Petroleum, Institute of, 61 New Cavendish Street, W.1. 5.30 p.m. W. B. Broadbent and G. A. Dickens: *Lubrication problems arising from railway traction modernization.*

THURS. 2 JAN. Aeronautical Society, Royal, at Royal Society of Arts, W.C.2. 3 p.m. A. W. Bedford: *Some aspects of test flying.*

Refrigeration, Institute of, at 14 Rochester Row, S.W.1. 5.30 p.m. W. F. Bows: *Properties, handling and storage of modern refrigerants.*

FRI. 3 JAN. Engineers, Junior Institution of, 14 Rochester Row, S.W.1. 7 p.m. Film evening: *Cables round the world and Diamond dies for wire drawing.*

SAT. 4 JAN. Interplanetary Society, British, at Caxton Hall, S.W.1. 6 p.m. Dr. R. F. L. Boyd: *High altitude research during the International Geophysical Year.*

TUES. 7 JAN. Civil Engineers, Institution of, Great George Street, S.W.1. 5.30 p.m. C. Peel, A. J. Carmichael and R. Smeardon: *No. 1 Berth, Tilbury Dock, Port of London Authority.*

WED. 8 JAN. Civil Engineers, Institution of, Great George Street, S.W.1. 6.30 p.m. Dugald Clerk Lecture, W. R. Hockaday: *Lifting equipment.*

Engineering Inspection, Institution of, at Royal Society of Arts, W.C.2. 6.45 p.m. D. N. Leplar: *Quality control of garment production.*

United Service Institution, Royal, Whitehall, S.W.1. 3 p.m. Lieut.-Gen. Sir John Glubb: *A further review of the Middle East.*

THURS. 9 JAN. Chemical Society, at 24 George Street, Edinburgh. 7.30 p.m. Dr. H. K. Cameron: *The pattern of research in the electrical industry.*

Naval Architects, Institution of, 10 Upper Belgrave Street, S.W.1. 4.45 p.m. Amos Ayte Lecture.

J. Ramsay Gebbie: *The evolution of the cargo ship during the last 35 years, and some thoughts on the years to come.*

MON. 13 JAN. Electrical Engineers, Institution of, Savoy Place, W.C.2. 5.30 p.m. Discussion: *The use of electricity in the garden by amateurs.*

Transport, Institute of, at 66 Portland Place, W.1. 6.45 p.m. C. P. Hopkins: *Railway freight traffic operation in the light of railway modernization.*

TUES. 14 JAN. Civil Engineers, Institution of, Great George Street, S.W.1. 5.30 p.m. N. J. Cochrane: *Lake Nyasa and the River Shire.*

TUES. 14 JAN. Metals, Institute of, at University College, Singleton Park, Swansea. 6.30 p.m. J. W. Menter: *Electron microscopy.*

THURS. 16 JAN. Analytical Chemistry, Society for, at The University, Edmund Street, Birmingham, 3. 6.30 p.m. A. F. Williams: *The analytical chemistry of nitrogen.*

Road Transport Engineers, Institute of, at Royal Society of Arts, W.C.2. 6.30 p.m. Dr. A. Fogg: *The work of the Motor Industry Research Association.*

FRI. 17 JAN. Chemical Society, at The University, Southampton. 5 p.m. Professor B. Lythgoe: *Some recent advances in the chemistry of the D-vitamins.*

TUES. 21 JAN. Architects, Royal Institute of British, 66 Portland Place, W.1. 6 p.m. Sir Herbert Manzoni: *Public parking garages.*

Chemical Engineers, Institution of, at The Hoare Memorial Hall, Church House, S.W.1. Whole day symposium: *Nuclear energy.*

Civil Engineers, Institution of, Great George Street, S.W.1. 5.30 p.m. J. F. Greinig, R. W. Horsman and A. N. Kinhead: *The design and construction of the foundations and pressure shell of the 8 ft. by 8 ft. high-speed wind tunnel of the R.A.E. Bedford.*

Industrial Transport Association, at Royal Society of Arts, W.C.2. 6.30 p.m. G. F. Fienness: *Future railway development, with particular relationship to transit.*

THURS. 23 JAN. Chemical Society, at Bristol University, 6.30 p.m. Dr. C. Bould: *Chemistry and plant nutrition.*

At Burlington House, W.1. 7.30 p.m. Dr. R. Spence: *Some new chemical instruments developed at Harwell.*

Metals, Institute of, at College of Technology, Gosta Green, Birmingham. 6.30 p.m. P. F. Hancock: *Electric furnace developments.*

Photographic Society, Royal, at Shell-Mex House, Strand, W.C.2. 6.30 p.m. J. N. Macdonald: *Health and safety in industry.*

Wool Education Society, at Royal Society of Arts, W.C.2. 7 p.m. H. Lemon: *For better fabrics: achievements of wool research.*

#### OTHER ACTIVITIES

NOW UNTIL SAT. 4 JAN. National Book League, 7 Albemarle Street, W.1. Mon.-Fri. 11-6.30, Thurs. 11-8, Sats. 11-5. *Ballet: Exhibition of books from 15th century manuscripts, etc.*

NOW UNTIL SUN. 5 JAN. Whitechapel Art Gallery, Whitechapel High Street, E.1. Exhibition of Painting and Sculpture: *East End Academy 1957.*

NOW UNTIL WED. 8 JAN. National Book League, at The Tate Gallery, Millbank, S.W.1. 10-6, Sundays 2-6. *Exhibition: Art Books.*

NOW UNTIL SUN. 12 JAN. Imperial Institute, S.W.7. Monday to Friday 10 a.m.-4.30 p.m. Saturday 10 a.m.-5 p.m. Sunday 2.30-6 p.m. *Exhibition: Canadian Eskimo Art.*



# THE ROYAL SOCIETY OF ARTS

JOHN ADAM STREET, ADELPHI, LONDON, W.C.2  
FOUNDED IN 1754 AND INCORPORATED BY ROYAL CHARTER IN 1847

PATRON: HER MAJESTY THE QUEEN

PRESIDENT: HIS ROYAL HIGHNESS THE DUKE OF EDINBURGH, K.G.

## PROPOSAL FORM FOR MEMBERSHIP

Candidate's }  
Name in full }

Nationality.....

Address .....

Rank, }  
Profession or }  
Business }

I desire to become a Fellow/an Associate Member of the Royal Society of Arts.

Signature of Candidate .....

Date of Birth .....

We hereby propose and recommend the above Candidate as a fit and proper person to become a Fellow/an Associate Member of the Royal Society for the Encouragement of Arts, Manufactures and Commerce.

Signatures of three fellows, at least one of whom must sign on personal knowledge :

Name in Block Capitals

Signature

[.....] .....  
(on personal knowledge)

[.....] .....

[.....] .....

Read and suspended..... Elected.....

Details of Candidate's past and present occupation, academic and professional qualifications (in the case of degrees the conferring University should be stated) and any other relevant information should be attached on a separate sheet.

Details of Candidate's past and present occupation, academic and professional qualifications (in the case of degrees the conferring University should be stated) and any other relevant information :

